FINANCIAL RETURNS TO SOCIETY BY PELL GRANT RECIPIENTS WHO OBTAIN AN ASSOCIATE IN SCIENCE DEGREE

By

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Abstract of Dissertation Presented to the Graduate School
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The purpose of this study was to determine whether society's investment, through Pell Grants, in students earning Associate in Science (AS) degrees in Florida community colleges is beneficial to society and the individuals who receive those funds. The study questions included the following: (a) How much Pell Grant money is used to fund educational opportunity for individuals who earn AS degrees in Florida community colleges? (b) Is the difference in the amount of federal taxes generated between pre- and post-AS-degree earnings sufficient to equal the cost of students' Pell Grant awards? (c) Does the age of the student at the time the AS degree is received affect the payback potential to society and to the graduate? (d) Are there differences in payback potential among the programs of study for an AS degree? (e) Do students who receive Pell

Grant funds earn more income after graduating from their programs than before completion of the degree? (f) Is there a difference between pre- and post-AS-degree income among the different programs of study?

This study examined 1994 graduates from three Florida community colleges who received Pell Grant funds prior to receiving an AS degree. The initial data were collected directly from the participating community colleges and included each student's Pell Grant award, major program of study, social security number, and birth date. These data were compiled and sent to the Florida Evaluation Testing and Information Program for accessing the Department of Labor wage database. The Department of Labor extracted 1991 and 1994 fourth-quarter earnings for students in the research study. Data collected from the community colleges and the Department of Labor then were reviewed.

The major findings of this study were that (a) students who receive Pell Grants while earning an AS degree repay the investment made by society by paying substantially increased federal taxes and (b) students repay society's investment within two work years after receiving the AS degree if they work full time.

CHAPTER 1
INTRODUCTION

The federal government is the largest provider of student financial aid to students in the United States. During the 1993-94 fiscal year the government spent more than $31 billion to provide educational assistance to students seeking college degrees or certificates (Almanac, 1995). Since the federal government provides such a substantial amount of funding to higher education and since all categories of federal assistance are now being scrutinized for possible cuts, knowing what benefits are gained by the federal expenditure of resources for such funds is important. This research will show what, if any, benefits may accrue to the individual and/or society from funds received through Title IV of the Higher Education Act of 1972, specifically in the form of Pell Grant funds.

The federal government's interest in higher education is based in part on an expectation that the return on their investment in higher education will benefit society as a whole. However, in times of fierce competition for limited funds, each program must show benefits that are worth the costs associated with the program. Therefore, understanding how society benefits from funding higher education is critical in determining whether such programs can continue to exist.

Although parents, students, and other third parties do contribute to financing postsecondary degrees, Gladieux (1994) stated that over the last 50 years it is the federal government that has borne the greatest brunt of this burden. Since the GI Bill in the 1940s when the government first began to involve itself in college financial assistance, the federal government has played a significant role in enabling students to attend college. This assistance has been provided through grants, loans, and work opportunities. In 1991-92, according to the Chronicle of Higher Education (Almanac, 1993), the largest single source of financial assistance was the federal government, which provided 74% of all student aid distributed in the United States.

The Pell Grant program was established in 1972 as the Basic Educational Opportunity Grant (BEOG) program. It is the largest federal grant program for students seeking a postsecondary degree or certificate. Gladieux (1992) indicated that in 1992-93 this program helped more than 4 million students by distributing more than $5 billion of this nonrepayable form of financial aid. However, despite the enormous cost to the government, there has been no research to determine if the program meets or has ever met the expectations inherent in its original establishment.

"Training is ultimately supposed to help people get better jobs at higher pay than they would have without it" (Hansen, 1994, p. 73). "It is in the allocation of our national resources--not in our promises, but in our spending decisions--that we demonstrate our national priorities. America must invest in the education of its citizens" (Frost, 1994, p. 251). There in an inherent expectation that the Pell Grant program is a good investment. However, no research was found in the literature that provided an estimate of the financial return from the Pell Grant investment. This study provides information for evaluating this investment in students who earn an Associate in Science (A.S.) degree in selected Florida community colleges.

Statement of the Problem

The problem addressed in this research involves the investment return to society from the Pell Grant program. The problem was studied in the context of persons who earned AS degrees in selected Florida community colleges during the spring of 1994. The specific study questions were as follows: 1. How much Pell Grant money is used to fund educational opportunity for individuals who earn AS degrees in Florida community colleges?

2. Will the difference between the taxes computed over the work expectancy on pre-A.S. degree wages and post-A.S. degree wages be equal or greater than the Pell Grant investment?

3. How long does it take to repay the Pell Grant investment after the student has graduated from the A.S. degree program?

4. Are there differences in payback potential among the programs of study for an AS degree?

5. Do students who receive Pell Grant funds receive more income after graduation from their program than before completion of the degree?

6. Is there a difference between pre- and post-training income among the different programs of study?

Few studies have been done that pertain to the investment of federal student financial aid in relationship to the benefits derived by the individual students and by society. Except for Judd (1989), who conducted a study regarding the value of obtaining an Associate in Arts (AA) degree for those students who did not transfer to a university, most other recent studies center on financial aid and persistence rather than analysis of economic data to determine the benefits obtained by such expenditure of funds.

Pell Grant expenditures account for a large percentage of the total federal educational assistance to individuals. In 1991-92 more than $30 billion in combined federal, state, and institutional aid for postsecondary education was distributed to students in the United States (Gladieux, 1992). According to Gladieux, the federal government distributed most of this aid, $21 billion, to students. Among the many educational funds given out by the federal government in 1991-92, the Pell Grant program and the Guaranteed Student Loan program were the largest and comprised approximately $5.2 billion and $13.7 billion, respectively, of school year expenditures (Gladieux, 1992).

Another reason for the importance of this study is that increasing numbers of students continue to enroll in college and are therefore completely or partially out of the capital production market. Any public policy that encourages young men and women to enroll in college rather than begin work after high school has the effect of reducing capital production for the country until some date in the future. If the delayed return to society is not sufficient to warrant such a policy, then the public policy of encouraging entry into college may need to be reexamined.

The Carnegie Foundation (1979) restated the goals of financial aid as follows:

> If the goal of financial assistance in higher education was to encourage student enrollment in college, then that happened during the 1980s and 1990s. It had been widely contended that rising college costs, and the resulting squeeze on middle-income families, would have discouraged college attendance. (p. 46)

However, "the 1980s turned out to be a pretty good decade for America's colleges and universities. Contrary to expectations, enrollments increased by more than one million students" (Hartle, 1990, p. 32). Of this enrollment, "evidence suggests that the political initiatives of the 1960s and 1970s succeeded in increasing enrollment rates for minority groups in higher education," one of the prime subgoals of student financial assistance (Stampen & Fenske, 1988, p. 337). In 1989-90, nearly 18.6 million students were enrolled in postsecondary education: 16 million undergraduate and 2 million graduate students. Byce and Khazzoom (1993) stated that 43% percent of undergraduates received some type of financial aid; 36% received grants, and 19% received loans (p. vi). Lewis (1989) said that grants increased from 40% of total federal aid in 1963-64 to 76% in 1975-76. Subsequently, federal grants shrank to about 31% in 1989-90. A record 3.2 million students received Pell Grants in 1989-90. Stafford Loan volume also increased during the 1980s, going from $4.3 billion in 1980 to $12.3 billion in 1990 (Frazier, 1991).

Determining the relevance of Pell Grants to individual achievement is important in understanding whether those funds provide a sufficient return to benefit society and the individual. Researchers may employ any one of several methods in an attempt to measure the returns for a college education. One of the more popular methods to measure returns to individuals and society is the internal rate of return method. Leslie and Brinkman (1988) explained the internal rate of return method in the following manner:

> Conventionally, the analyst estimates from workers' estimated earnings profiles the expected

> stream of lifetime earnings for graduates and non-graduates. And from college cost data estimates, the cost of attendance. After costs are corrected to current dollars through compounding, the analyst calculates the interest or discount rate that would set the earnings value equal to the cost value. This is the internal rate of return. (p. 46)

In his book, Human Capital, Becker (1993) indicated "that the average money rate of return on a college education to white males is between 11%-13%. . . . This range for the rate of return on college education . . . has also been found in many subsequent studies" (p. 7). This study, however, focused on gaining the necessary data to evaluate the usefulness of continuing support for the Pell Grant program. This study examined the levels of income and the years required to return the value of the Pell Grant to society. The study also allowed for generalizations to be made about the time required for payback of taxpayer funds based on the entry level of employment as well as about the effect the student's age has on the time variable.

Conceptual Framework

Questions concerning the positive relationship between work production (i.e., the opportunity to generate income) and receipt of financial aid provide a viable evaluation standard in which to compare data. This study examined the relationship between the receipt of Pell Grant aid and the enhanced production value generated by the student. Production value, by definition, is the generation of wages (and, therefore, payment of taxes) from employment pursuits.

Positive production value is the increase of wage abilities due to job opportunities available because of educational training or exposure. "In other words, value added is the increment in the proportion of people getting a job as a result of training" (Hansen, 1963, p. 74).

The literature review exposed much research on financial aid and persistence, but nothing on the correlation between financial aid and production capacity (or human capital). Human capital, the power of individuals to produce goods and services, provides a sense of the production value or production capacity that one would expect from an investment of this kind. Although the federal government spends so much money in support of students seeking higher education, there is no government agency or entity that tracks the long-range production effects of those students. There are many costs and benefits to society as the supporting tax base, and society should ask questions about these costs and benefits. The expanded question must be whether there is a future offset in human capital production for the monies invested in financial aid to students.

"Debt burden" is a concept used by banks and other financial managers to measure the manageability of debt by particular entities. A recent report from the U.S. Department of Education (1988) cited Daniere, who concluded that tolerable education indebtedness should not exceed 6.4%

of a borrower's pretax income. Perhaps, when expending such massive amounts of federal dollars, there is an equivalent dollar limit or percentage where it becomes questionable to continue spending these funds. If the expected investment return does not match the expenditure, then perhaps the investment may not match the return. In other words, a program not meeting some minimum threshold of return or value may become too expensive to be considered justifiable. For federal financial aid expenditures we need to look not only at the initial input of federal funds but also at their future return.

"Much of school-based postsecondary training is funded through formulas that lead to a preoccupation with enrollments rather than with outcomes or value added" (Hansen, 1963, p. 90). Perhaps it is time that we look not only at training outcomes but also at financial assistance outcomes to see whether there is enough value for the investment. The two largest federal programs designed to assist postsecondary students are the Pell Grant and Stafford Loan programs. However, because much already has been written about the Guaranteed Student Loan program, both pro and con, this study chooses to focus on the Pell Grant program. The Pell Grant program constitutes the remaining lion's share expenditure of all Title IV programs. Gladieux reported that four million people received average Pell awards of $1,302 in 1991-92.

"The prospect of unmanageable debt is discouraging some young people from beginning college" (Byron, 1989, p. 25). The specter of higher debt and questionable return for their time and value are causing some students to reevaluate whether higher education is an option for them. However, the federal government also may need to reassess its structuring of assistance to students attempting higher education. It may prove true that if the federal government continues to spend tax dollars without sufficient accountability to society, then one day federal student financial aid to higher education may be obsolete or broadly diminished. The government and society must begin to evaluate whether Pell Grant funds are accomplishing their original purposes, and given the need for an investment return, is it happening in a socially optimizing manner.

Financing College Education

Generally, if one looks back through this century at the American pattern of paying for college, one can see that there were generally three ways to pay for college: the family (student and parents), government (federal, state, and local), or philanthropy (private donors). "It has been roughly estimated that in 1930, families overall paid almost two-thirds of the college bill, government a little more than a fifth of the college bill, and philanthropy the remainder" (Gladieux, 1994, p. 107). "The long-range trend in America has been for the public to assume a larger share of the burden for financing an individual student's higher education" (Carnegie Foundation, 1979, p. 141). However, this is subject to review, as recent reports suggest that parents continue to provide large sources of revenue for college-age students (Hansen, 1991; Byce, 1993).

"The tradition of awarding aid to students who are financially needy goes back to prerevolutionary times, when the earliest colonial colleges made awards to 'worthy poor'" (Hansen, 1991, p. 9). However, the conscious societal decision to extend aid to its citizenry blossomed in the twentieth century.

> The increase in the commitment of public funds to student aid programs has been the most remarkable development in public support for higher education in the last decade. The public share of student aid from all sources shifted correspondingly from about two-thirds at the beginning of the decade to almost 90 percent currently. (Carnegie Foundation, 1979, p. 6)

"If we consider that the state also acts, indirectly, to support students through subsidized lower tuition at public schools, one can easily see that government has stepped in to become the largest financial supporter of both students and colleges" (McPherson, 1989, p. 57). Richard Schrubb (1992) said in his dissertation about financial aid that the public programs which involve money, controversy and scrutiny, such as the Pell Grant Program, have to be constantly evaluated and fine turned.

Partly because of the immensity of federal educational aid expenditures and partly because of the government's involvement, few have ever questioned whether federal aid programs are configured appropriately to meet their broad policy objectives. The public tends to accept unequivocally the belief that federal educational aid programs are meeting America's societal expectations, even if society just thinks of the technicalities of each program. "Federal student loan policy was not devised, it happened" (Gladieux, 1989, p. 1). Other aid programs, like the Pell Grant program, also happened in response to societal demands, over time and in no especially systematic manner. Perhaps it is time that society revisits the conceptual ideas and methodology involved in the creation, formulation, and distribution of financial aid, specifically the Pell Grant program, to determine if the concepts behind the development of this fund in 1972 are still appropriate given today's political and financial environment.

Positive Production

> For both society and the individual, higher education should be viewed as an investment in search of future returns. Indeed when such an investment occurs, it involves a considerable opportunity cost to public and private parties, in terms of direct expenditure and foregone earnings, while the returns to undergraduate education accrue over a lifetime. This investment principle is an important one and many issues revolve around it. Two fundamental ones are whether the returns to investment in higher education exceed the costs, both from the point of view of the individual and from that of society. (McPherson & Schapiro, 1991, p. 153)

There must be some means to determine whether the investment that society has made in a student has been capitalized, refunded, or bankrupted. To this end, several potential indicators of a positive return can be enunciated and delineated as acceptable outcomes of a college education. These potential outcomes seem to require one or more of the following attributes: (a) employment in an occupation for which one becomes suited because of the training opportunity, (b) employment or involvement in a voluntary or semivoluntary organization, agency, or career which would have been impossible without the attained training (e.g., military service rankings, participation in voluntary organizations such as the Peace Corps), (c) continuation in a postgraduate educational program that required attainment of a specific degree before entrance into the new program (e.g., law, medicine, graduate school), and (d) advancement in a field that would have been unavailable without such training (e.g., LPN to RN, nurse's aide to LPN).

Correspondingly, several types of investment returns may not be considered to be positive. Some negative returns might include such things as (a) failure to complete the training for which one received financial aid, (b) employment in a job for which such training was unnecessary or not required, (c) unemployment, or (d) receipt of welfare benefits that accrue because of limited or no income.

Other positive or negative investment returns also may exist. The purpose of the above is merely to serve as a possible listing of some education-related outcomes and should not be considered as all encompassing.

Definitions

The following definitions were used for purposes of this study:

Attainment is the completion of a student's educational objective (i.e., graduation, completion, etc.).

Financial aid is assistance rendered to students attending a higher education institution. There are three broad types of financial aid (grants, work, and loans). This study will concentrate on a particular program, the Pell Grant, which is a nonrepayable federal grant.

A grant is a sum of money given to a student to attend college without the necessity of his/her repaying those funds.

Lower income is a term describing a family unit's general total annual financial earnings. Generally, for this study, it is equivalent to a family of four who earn less than $15,000 annually in 1992 constant dollars.

Middle income is a term describing a family unit's general total annual financial earnings. In 1992 constant dollars, it is considered gross income between $15,000 and $60,000 for a family of four people.

A Pell Grant is a nonrepayable form of aid considered the base, or floor, of federal financial assistance to students in higher education. All students must apply for a Pell Grant before they are considered for other federal aid. Awards have ranged from $200 to $2,400 depending on the year and the student's category (dependent vs. independent).

Persistence is the continued, uninterrupted movement (not including typical school-year breaks) toward a degree or certificate during which a student is enrolled in a program of study and does not leave college without attaining his or her educational goals.

Production (production value) is the use of one's attained education to provide a level of support for him/herself and family, providing a level of income that would not have been possible without such attainment.

Title IV Aid is federal monetary assistance, authorized through Title IV of federal regulations, to students seeking postsecondary education.

Justification for the Study

There have many studies in the past that analyzed different aspects of financial aid to students in higher education, such as persistence toward the degree and the ability of lower-income families to access higher education through financial aid assistance. However, there have not been any studies that address the economic impact and ramifications to society of the heavy subsidization of students as is done in the United States.

> Since the advent in about 1960 of the "human capital" revolution in economics, a great many studies have attempted to estimate the returns to education in general and to college education in particular. . . . Such calculations of social returns compare pre-tax rather than post-tax earnings differentials, and consider the social rather than individual costs of schooling. . . . A number of controversies bedevil these efforts. . . . Despite these difficulties, a wide variety of studies, using different data and statistical techniques, have arrived at fairly similar estimates of the private returns to college: at reasonable discount rates, private returns exceed the costs of the investment, and social return are usually found to equal or exceed private returns. (McPherson & Schapiro, 1991, p. 155)

This study used a sample of Florida community college students to determine, through statistical analysis and descriptive data, whether societal returns justify the Pell Grant awards. Society should expect that the dollars spent on the investment of human capital are not wasted. Waste, however, is a relative term that is subject to philosophical debate, and therefore society must define what determines waste.

One possible definition of waste is a lack of investment return (monetary or in kind) from an original investment. For individuals who receive financial aid to attend college, subsequent employment could be considered a good return on a societal investment since payment of federal taxes could be viewed as a positive by-product of education. Students who receive financial aid but who fail to use their education to further themselves or society could be viewed, in one sense, as poor returns on a federal investment. This poor return on an investment could create a "grant-default" equivalent, much as the student loan default is to the federal student loan program.

The Stafford Student Loan Program, previously called the Guaranteed Student Loan Program, was established in 1965 to give students a source of funds to help finance their education (Frazier, 1991). "Stafford loan volume increased during the 1980s, from $4.3 billion in fiscal year 1980 to $12.3 billion in 1990. As loan volume rose, federal default payments to guaranty agencies also increased dramatically, from about $144 million in 1980 to $2.4 billion in 1990, an increase of more than 1600%" (Frazier, 1991, p. 2). Over time, the characteristics of a Stafford Loan defaulter have been identified and characterized by the federal government. These characteristics, as identified by the General Accounting Office (1991), include (a) attended vocational/trade schools, (b) had low incomes, (c) had little financial support, (d) had minority backgrounds, (e) lacked high school diplomas, (f) failed to complete their education programs, (g) attended school for one year or less, (h) borrowed small amounts, and (i) were unemployed when defaulting. These same attributes might also apply to recipients of Pell Grants who failed to attain the education for which they were subsidized and hence failed to produce enhanced federal taxes. The amount of "production-default" might be staggering if applied in the same sense. "From a modest beginning of $546 million in 1963-64, the growth in student aid has been phenomenal" (Lewis, 1989, p. 547). Pell Grant funds, according to Lewis, increased from $50 million in 1973-74 to an estimated $4.9 billion in 1991-92. This phenomenal investment by the United States in Pell Grant funds and the possible amount of production-default of federally aided students are substantial. There should be some accountability standard by which the American people can judge whether a program meets its societal obligations. Cohn and Geske (1986) said,

> If it is assumed that decision makers (government and individuals) seek to maximize social welfare or their own well-being, respectively, then the maximum social gain principle dictates that prospective benefits must exceed anticipated costs and more important, that the excess of benefits over costs must be maximized. (p. 184)

One means of validating investment return is to look at enhanced income generation ability of the student once the education is completed. This enhanced income not only allows the student to purchase increased goods and services but also to generate additional revenues to the federal government in the form of tax dollars, which grow at a corresponding rate as better job opportunities become available to the student. This study will examine the income needed to repay the Pell Grant program which, in effect, is the money required to repay the government investment.

It is recognized that many other societal and personal values derived from education are ignored in this type of study. Those values deserve additional study; however, this research study was limited to monetary value considerations.

Limitations

This study was limited in several respects. The following outlines these limitations:

1. The study was limited to selected Florida community college students whose demographic and financial data were available through state agencies.
2. The study was limited to a review of investment returns through increased income generation due to employment following use of Pell Grant funds.
3. The study was limited to students who received Pell Grant funds and did not examine other types of financial aid.

CHAPTER 2
REVIEW OF THE LITERATURE

This research concerns the Pell Grant program, which is a federally funded program; therefore, the following discussion will be limited to the federal government's involvement in student financial aid.

The Evolving Federal Role in Financial Aid

"The federal role in higher education is multifaceted and can appear to be insignificant, supportive, intrusive, or dominant depending on the observer, the issues in question, and the institutions involved" (Hartle & Stedman, 1986, p. 133). Although education is not mentioned in the U.S. Constitution, the federal government has always had the power to influence education in America. The federal government has been involved in the education of its citizenry almost from the inception of the country.

> The national government demonstrated an interest in education even before ratification of the U.S. Constitution. For example, in 1787 the Confederation Congress approved land grants to support a common school system in the Northwest Territory. After the U.S. Constitution was ratified, the constitution of each new state admitted into the union included provisions for establishment of a common school system and for earnings derived from the federal land grants to be used for support of the common school. (Rossmiller, 1990, p. 4)

Because Congress is authorized to levy and collect taxes for the common defense and general welfare of the populace, it is able to exert considerable influence over the educational policies of the states and the nation.

E. L. Lindman is quoted in Rossmiller (1990) as saying that there are five generally accepted purposes served by the federal government's involvement in education. They are (a) to promote the cause of education, (b) to broaden the scope of education, (c) to educate individuals for whom the federal government accepts responsibility, (d) to improve the quality of education, and (e) to compensate for deficiencies in the school tax base. The federal government's policies in regard to higher education are best addressed in items (a) promoting the cause of education, (b) educating individuals for whom the federal government accepts responsibility, and (c) improving the quality of education. The federal government's influence in these areas can be seen in programs that were established under the auspices of these purposes. Lindman said that to promote the cause of education, the federal government passed the Morrill Act (1862) and established a federal education agency (1867). To educate individuals for whom the federal government accepts some responsibility, Congress enacted the Johnson-O'Malley Act in 1934 (for American Indian children), the Servicemen's Readjustment Act in 1944, and programs for Cuban refugees. "To improve the quality of education the federal government enacted the National Science Foundation (1957) and the National Defense Education Act (1958)" (Rossmiller, 1990, p. 5). These acts directly initiated assistance to particular groups of people. "The various benefits given to World War II armed services veterans represents the first federal program that gave dollars (benefits) directly to students, perhaps setting the tone for the sweeping federal involvement which began in the 1960s" (McCarthy & Hines, 1986, p. 20).

"Beginning with the Morrill Act in 1862, we begin to see more strings attached to federal dollars for education" (Rossmiller, 1990, p. 45). As the federal government involvement in education increased, so did its use of categorical funding, or funding for specific purposes. Additionally, the influence of federal policy on education was most pronounced during or after times of war or national emergency as the country struggled to adjust to changing technology or events.

"Prior to the 1940s, the federal government's extent of involvement was essentially the mere granting of land grants to states to support the establishment of higher education. However, beginning in 1949 with the initiation of the G.I. Bill, the federal government took a more proactive role in financing higher education for the American populace. The GI Bill successfully brought thousands of new students through the doors of higher education and proved a boon for those individuals fortunate enough to take advantage of the opportunities provided by the federal government" (Carnegie Foundation, 1979, p. 69). Hartle (1990) said, "World War II marked a turning point in financial aid. The Serviceman's Readjustment Act of 1944, better known as the GI Bill, enabled millions of veterans to enroll in institutions of higher education" (p. 35).

The Cold War of the 1950s was another impetus in this century to expand opportunities for students seeking access to higher education. Russia's launching of the Sputnik satellite in 1957 effectively galvanized the federal government into establishment of the National Defense Education Act. This act, established in 1958, authorized the Federal Student Loan program, which was the precursor to the Perkins Loan program of today (Hansen, 1991, p. 4). The program offered low-interest loans and repayment terms that some have described as generous. However, except for this student loan program, most students had little outside assistance except parental and philanthropic support for higher education until events of the 1960s focused on access to higher education.

In the early 1960s some support for students in medicine, dentistry, and osteopathy was provided through another loan medium, and nurse trainees were also helped under the Health Professions Assistance Act of 1965 (Hansen, 1991). However, it was not until the mid-1960s that government began to focus on a more global scale for U.S. citizens.

> As part of the War on Poverty's broad assault on social problems, Congress and President Lyndon Johnson approved the College Work-Study program in 1964 to subsidize employment for financially needy college students and the Educational Opportunity Grants (EOG) for such students in 1965. (The latter is now Supplemental Educational Opportunity Grants.) In addition, in 1965 Congress enacted the Guaranteed Student Loan Program, aimed primarily at middle-income students whose families, although not financially needy, might need help with cash-flow demands during the college years. (Hansen, 1991, p. 4)

In effect, the government had created a three-tier structure of federal assistance by way of grants, work, and loans, a system that continues to this day. Additionally, Congress modified the Social Security Program in 1965 to allow deceased and disabled workers' children to receive educational benefits if they enrolled full-time in higher education. "Congress also promised financial help to middle-income people when they passed a tuition tax credit in 1964" (Hansen, 1991, p. 8).

Students can avail themselves of loans through private lenders, and the EOG and work study through the colleges. However, "because colleges were only given annual appropriations by the federal government for EOG and work study, students often had no idea of the amount of money they would receive, and this process seemed at odds with the educational goals of the programs" (Hansen, 1991, p. 5).

> The role and scope of federal student financial aid activities have been periodically debated and revised. In the 1950s a post-Sputnik drive to increase the nation's stock of scientific manpower motivated the formation of the National Direct Student Loan Program. In the mid-1960s a desire to equalize educational opportunities across income classes became prominent. The Basic Educational Opportunity Grant, initiated in 1973, gave full expression to this policy goal. (Manski & Wise, 1983, p. 118)

Recent Federal Role in Higher Education

"The contours and objectives of the federal role are periodically debated and redefined, most often when the Higher Education Act must be reauthorized. On some occasions the federal action is monumental, as it was when the Higher Education Act was created in 1965" (Hartle & Stedman, 1986, p. 133).

"Beginning with the 1965 Higher Education Act, the federal government embarked on an educational policy designed, primarily, to assist lower economic income students" (Hartle & Stedman, 1986, p. 12). This agenda remained intact through the education amendments of 1972 and into the late 1970s. However, near the end of that decade middle-income families began to seek relief from the federal government, and in response Congress enacted the Middle Income Student Assistance Act of 1978. "This law modified the need-analysis calculations in the Pell Grant program and made more middle-income families eligible for assistance" (Hartle, 1990, p. 13). It expanded the BEOG and removed income restrictions for Guaranteed Student Loan applicants

(Brooks, 1986). "The expansion of student aid programs proved very expensive. In 1981, as part of the Omnibus Budget Reconciliation Act, Congress made a number of changes to restrain the growth in student aid spending" (Hartle, 1990, p. 37).

Table 1 shows the explosive growth of the Pell Grant program from its inception to the early 1980s. "Federal expenditures for higher education were virtually out of control when President Reagan was inaugurated. It therefore fell to the new President to find ways to cut or curb expenditures, not increase them" (Hartle, 1990, p. 113). To do this, several recommendations to curb spending were enacted in the Omnibus Reconciliation Act of 1981. This act established a needs test to limit access to the Guaranteed Student Loan program, and it also imposed limits on the Pell Grant program.

Table 1. Growth of the Pell Grant Program

FY	Appropriations	Recipients	Annual Grant	Author. Max.	Actual Max.
73	122,000,000	176,000	270	1,400	452
74	475,000,000	567,000	628	1,400	1,050
75	840,200,000	1,217,000	761	1,400	1,400
76	1,325,800,000	1,944,000	759	1,400	1,400
77	1,903,900,000	2,011,000	758	1,400	1,400
78	2,140,000,000	1,893,000	814	1,800	1,600
79	2,431,000,000	2,537,875	929	1,800	1,800
80	1,578,000,000	2,707,932	882	1,800	1,750
81	2,604,000,000	2,709,076	849	1,900	1,670
82	2,419,040,000	2,522,746	959	2,100	1,800
83	2,419,040,000	2,758,906	1,014	2,300	1,800

Source: Boren, 1989, p. 14

Beginning with implementation of the Omnibus Reconciliation Act, the Pell Grant program was modified so that the program's authorization (to spend) ceilings would not be exceeded. Previously, this program had been an entitlement program, requiring that the federal government appropriate whatever funds were necessary to serve all eligible students.

Another important change that affected higher education students was the phaseout of eligible funds for students who had received benefits as dependents or survivors of social security beneficiaries. Hartle (1990) stated that the Social Security Higher Education component was phased out completely in October 1985. However, of all the programs initiated by the federal government, the Pell Grant program continues to remain the primary "floor" or base of financial educational assistance on which all other educational assistance is given. Therefore, it is important to understand the ramifications and effects of this program on federal financial aid as a whole.

The Pell Grant Program

The 1972 amendments to the Higher Education Act of 1965 enacted what would become the main thrust of federal financial assistance--helping the needy to attend college. Boren (1989) tells us that the BEOG program, now renamed the Pell Grant program, was first authorized and incorporated into the Higher Education Act by the Education Amendments of

1972. The original purpose of the Pell Grant program was to help undergraduates from low-income families finance their postsecondary education. Pell Grants, a nonrepayable source of assistance, were initially designed to be the foundation for student aid upon which to build a student aid package. This package would include other nonfederal and federal grant and loan programs to help meet the full cost of postsecondary education attendance. "The original intent was to help equalize educational opportunity across income classes using the vehicle of student aid" (Boren, 1989 p. 23). Congress and leaders in higher education did not want financial aid to rely on a state allocation formula which allowed students in some states to receive more aid than others. "The 1972 Education Amendments contained no state's formula and established more uniform standards of eligibility for all students" (Hansen, 1991, p. 5).

Originally, the Pell Grant program was designed only for full-time students and would contribute up to one-half the cost of attendance at a postsecondary school. The Pell Grant program, according to Boren (1989), has been changed or modified several times since its original inception in 1972. The Education Amendments of 1976 and 1977 modified the Pell Grant program only slightly in that its authorization was extended and the maximum grant was raised from $1,400 to $1,800 per academic year.

In her analysis of the Pell Grant program, Hansen (1991) said that the sweeping changes brought about by the 1978 Middle Income Assistance Act served to broaden the Pell Grant program so that many more middle-income students were eligible to participate. The BEOG contribution was changed so that parents were required to make smaller family contributions, resulting in larger awards to these students.

The Education Amendment of 1980 renamed the BEOG as the Pell Grant in honor of its original sponsor, Claiborne Pell. These amendments also changed maximum grant levels (authorizing up to $1,800 per academic year) and extending the Pell Grant to part-time students. "The provision for meeting half the cost of attendance was modified so that as maximum grant levels rose, Pell Grants could meet up to 70% of the cost of attendance when Pell Grant maximums reached $2,600" (Boren, 1989, p. 24). To date, that has never happened.

Boren (1989) states that the Omnibus Reconciliation Act of 1981 saw the first of many restrictions placed on the Pell Grant program. Specific authorization ceilings were set for the first time, thereby changing it from an entitlement program to a quasientitlement program. In order to accomplish many of the act's requirements, substantial components of the Pell Grant program were changed. Pell Grant formulas were now required to remain separate from other federal financial aid determinations, and the maximum Pell Grant was set at $1,800 for the 1982-83 school year.

"The Education Amendments of 1986 extended the Pell Grant program, but also made significant changes to its methodology" (Boren, 1989, p. 25). The maximum Pell Grant was adjusted to $2,300 for fiscal year 1987, with suggested increases up to $200 each year thereafter (due to budget restrictions this has never transpired). Other major changes were a new system of needs analysis for Pell Grants, a new definition of an independent student, a cost limit at 60% of a student's cost of attendance, and allowances for handicapped and child care expenses in the Pell Grant budget. The new Pell Grant formula limited living expenses for students living at home with parents to $1,700, and to $2,400 for all other students. The 1986 amendments also gave financial aid administrators "professional discretion" over the calculation of the eligibility index (Boren, 1989, p. 26). Since that time other minor changes have occurred in the Pell Grant formula, such as increases in living costs to $1,800 and $2,400.

Pell Grant Program Description

The Pell Grant program is authorized by Title IV, Part A, of the Higher Education Act of 1972. The federal government is the sole provider of these funds to higher education students. According to Boren (1989), grants are determined individually and can not exceed the least of the following: (a) 60% of the cost of attendance, (b) the cost of attendance minus the expected family contribution, or (c) the maximum Pell Grant award minus the expected family contribution. The maximum award varies by year and is set by federal appropriations. For academic year 1988-89 the maximum award was $2,200, and from 1990 to present was $2,300.

Pell Grant applicants must submit to a "needs test," which is done through an application for federal financial assistance. This test determines a student's contribution and the expected family contribution (EFC) to the total cost of attending a particular postsecondary institution. This quotient generated by the needs test is called a Student Aid Index (SAI). The lower the SAI, the larger the amount of Pell Grant the student will receive.

A student's final award actually is determined by the following: (a) the student's SAI, (b) the total cost of attendance, (c) the student's enrollment status (i.e., full time, half time, or less than half time), and (d) the type of academic calendar under which the student is attending (credit hours, clock hours, semester hours, etc.).

Student Eligibility

Boren (1989) described the eligibility criteria for students receiving Pell Grants as similar to other federal educational aid programs. To be eligible for a Pell Grant, students must meet the following criteria: (a) be enrolled at least on a part-time basis, (b) be a regular student, (c) be an undergraduate student, (d) be making satisfactory progress in an accredited institution of postsecondary education, (e) be a U.S. citizen or eligible noncitizen, and (f) not owe a refund or be in default on a Stafford or Perkins Loan. Additionally, the student must sign a statement that he/she will use Pell Grant funds only for expenses related to attending school as well as a statement that he/she has registered with the selective service, if required (Boren, 1989).

Several definitions may be in order to better understand student eligibility. First, a regular student means a student who is enrolled in an eligible program for the purpose of obtaining a degree or certificate. An eligible program is defined by federal guidelines generally as any college credit program, a college program that requires more than 400 clock hours for its completion, or a college credit certificate program. Students must, according to Boren (1989), attend accredited institutions to be eligible to use their Pell Grants; therefore, colleges and universities enter an agreement with the Department of Education to participate in the Pell Grant program.

Undergraduate study is defined as a program four to five academic years in duration, designed to lead to a first postsecondary degree. Programs longer than five years, such as medical programs, will have the first four years considered as the undergraduate period of study.

Satisfactory progress is defined at each specific educational institution. However, at a minimum, institutional standards must contain a quantitative and qualitative measure in the satisfactory progress components. The quantitative measure requires that institutions delineate some unit of a time measure, such as an academic term, to define the length of time a student is eligible to receive Pell Grant funds. Institutions also must develop a qualitative standard, typically grades, to gauge qualitative accountability. At a minimum, students must maintain a "C" grade point average by the end of the second academic year of study (Boren, 1989).

Boren (1989) explains that eligible citizens or noncitizens include U.S. citizens and permanent residents who have a I551, I155, or I551-C card. Others who possibly are eligible are individuals granted the following statuses by the immigration and naturalization service: refugee, asylum-granted, indefinite or humanitarian parole, Cuban Haitian entrant, conditional entrant, or other noncitizen with a temporary resident card.

Student Application Process

Grants are awarded annually, and therefore students must apply for Pell Grants each year. Official application can be done through one of several methods. In the past, students were able to apply using applications provided by any one of several processors, for a small fee, or directly by completing an Application for Student Financial Aid. Beginning with the 1992-93 application year, students apply directly using a free federal application.

The application process is used for the federal government to determine the EFC (Boren, 1989). Through the years the methodology for determining Pell Grant eligibility has fluctuated. Generally, however, the government has looked primarily at income and assets of the students and parents to determine family contribution. Some of the items most determinant for students in this process are (a) adjusted gross income of the student and his/her parents, (b) number of members in the household, (c) number of household members attending a postsecondary institution on at least a half-time basis, and (d) other untaxed income and benefits. At one time, the equity of a primary residence was included in the calculation of Pell Grant eligibility. However, that component of determining need was eliminated in the 1992-93 processing year.

Types of Pell Grant Students

Students who apply for Pell Grants fall into two main definitional categories: dependent and independent students. The definition of a dependent student has changed several times over the past 20 years; however, the most recent definition of a dependent student is one who (a) receives more than 50% of support from his/her parents or guardians, (b) is not a veteran, (c) does not have any dependents, or (d) is under age 24. "Students classified as dependent must claim all parental income and assets when completing an application for Pell Grant" (Boren, 1989, p. 27).

Independent students are those who do not rely on their parents for the majority of their support, have dependents, are veterans, or are over age 24. Students classified as independent are not required to provide parental information when completing an application for a Pell Grant. Other students such as orphans or wards of the court may be determined to be independent (Boren, 1989).

Cost of Attendance

An important factor in the calculation of need for financial aid is the expected cost of attendance. The cost of attendance at an educational institution will affect how much aid a student can expect to receive to attend college.

> There are several measures that can be used to describe a student's cost of attendance. Some are budgets, which are constructed at the institution by the financial aid administrator. . . . The two major most commonly used budgets are the one used in the Pell Grant program, and the more general congressional methodology (CM) budget. (Byce, 1993, p. 33)

The Pell Grant budget is the sum of tuition/fees for a full-time student; a living expense allowance for room, board, books, and supplies; and transportation and other expenses, limited to $1,800 for students living at home, and

$2,400 for all other students. This budget is then used against a Pell Grant payment table to determine how much Pell Grant money a student will receive, based on his/her SAI (Brooks, 1986).

Federal Financial Aid

Presently, students complete an application for federal benefits, which are determined through a statutory formula. Financial aid, except for the Pell Grant, is a partially a measure of the student's choice of colleges, which detemerines other eligibility. Lewis (1989) stated that in 1963-64, when federal student aid consisted primarily of the National Defense Student Loan and veteran's educational benefits, the federal government supplied only 25% of total student aid. In contrast, "the federal government in 1991-92 provided 74% of all available student aid, down from a high of 80% in 1980" (Gladieux, 1991, p. 3). In 1991 the Pell Grant program spent $4.9 billion to help more than 3.2 million aid recipients (Boren, 1989). The Pell Grant program is the second largest federal student aid support program for higher education, surpassed only by the Guaranteed Student Loan Program. Data about federal assistance to students are limited. Hansen (1991) stated that it was not until 1986-87 that the federal government began what became a triennial survey on financial patterns. However, data from the National Postsecondary Student Aid Survey for 1986-87 and 1989-90 slowly are being analyzed, reviewed, and published, and these figures present a picture of federal financial involvement today. Using those figures, Hansen (1991) found that approximately 49% of all students enrolled in undergraduate education receive some sort of financial assistance. Of all the aid received by undergraduates, about 62% comes from federal programs.

Financial Aid's Intent

"Equalizing opportunity was the explicit rationale for the creation of most federal student federal aid. Yet its objective is difficult to measure and even more difficult to achieve" (Hansen, 1991, p. 13). "Student aid programs have not operated in isolation. They have played a larger role in a context of educational and social change. Their influence on enrollments, in particular, has been in conjunction with that of other trends, other public policies and changes in attitudes toward higher education" (Carnegie Foundation, 1979, p. 113). "Major efforts have been exerted since the early 1970s to construct an equitable and effective student financial aid system" (Stampen & Cabrera, 1988, p. 29). Therefore, assurance that the kinds of funds being invested by the government are doing what they were intended to do is critical. McPherson and Schapiro (1991) stated,

> That government has a legitimate role to play in improving the accessibility of higher education is not a claim that needs extended defense. Even in the narrowest economic terms, an argument can be made that educational investments generally pay more returns than equal to their costs, and that

> without government intervention difficulties in paying for education would certainly lead to under-investment by potential students. (p. 2)

Evidence, supported by human capital theorists, back McPherson and Schapiro's (1991) contentions that educational investments generally pay returns more than equal to their costs. This hypothesis is that America would suffer if the federal government did not invest using this methodology. Unfortunately, the federal government did not track financial recipients to any great extent until the recent year or two (J. Kamenski, personal communication, June 15, 1994). "Ideally, data for evaluating the equity and effectiveness of the student aid system would be longitudinal, statistically sampled, and designed to provide detailed information about potential as well as present and past students in all types of postsecondary institutions" (Stampen & Cabrera, p. 4).

The resources available from the federal government do not clearly define that the purpose of financial aid is to help students get better jobs. In almost every federal legislation authorizing or establishing financial aid, the language merely speaks to equalizing opportunity for college access, not specifically of helping students get jobs. McPherson (1988) stated that financial aid had three broad objectives: (a) equal educational opportunity for all, (b) fairer sharing of college costs, and (c) more stable institutional financial ability. However, given the financial shortfalls that have befallen modern education in the 1990s, society apparently will have to continue to make hard choices about how it spends its money, the return on its investments, and the desirability of a particular investment. The $5 billion Pell Grant fund may eventually make a tempting target for budget cuts. Therefore, it seems reasonable that while the prime motive behind the establishment of the Pell Grant program was to ensure access to a higher education, it may also be reasonable to assume that it would ultimately lead a student to a better job. This better job would then make one a productive citizen of the country, producing goods or services and, as a result, generating enhanced revenues for one's self and producing tax revenue for the federal government, which could by that be translated into projects for other social good. Because this assumption seems to underlie the concept of federal financial assistance, it seems more is needed than just information on whether financial aid allows one to persist. Society survives only if its citizens persist and produce. Production, again, is defined as the positive after-effect of receiving an education, which qualifies one to do work at a better or higher wage or to engage in a service or activity because of this advanced training or knowledge.

Better Employment and Persistence

While certainly the value of positive production is critical to determining whether a sufficient return on an investment exists, it also may be beneficial to look at the data regarding persistence to the degree or certificate. Persistence is the trait that enables one to complete training, achieve an enhanced level of educational training, and obtain a better quality job than previous to the training. Much has been written about financial aid's impact on student persistence. This subsequent section is not intended to be anything more than a brief overview of literature in this area, since persistence toward a degree is required in order to complete the degree and thereby become productive. "What do we know about student aid and its effect on student persistence? The answer to this question depends on the assumptions made about the effects student aid should have" (Porter, 1991, p. 77).

In testimony before the Subcommittee on Education, Arts, and Humanities, Blanchette (1994) said, "The policy goal of promoting access to higher education is inextricably related to facilitating student persistence. Initial enrollment increases among certain groups [sic] (lower income) has limited value if those students never complete their educations. Therefore, we need to know more about persistence" (p. 1).

It seems that there are two broad approaches to determining whether financial aid is accomplishing its purposes. "Although studies differ widely in data sources and estimation techniques, they tend to agree on two main points. First, student decisions to enroll in college respond positively and nontrivially to both price cuts and aid increases. Second, decisions about where to attend school also respond nontrivially to changes in the relative prices of schooling alternatives" (McPherson & Schapiro, 1991, p. 45). One of the premier studies in this area was done by Manski-Wise. This study tracked a sample of 1972 high school graduates pertaining to college selection and choice. Given a student's academic performance and specific geographic location, Manski-Wise developed a model to estimate how much aid a student would have been offered at his/her college of choice, and a model to determine the effect of college enrollment had there been no Pell Grant.

The Manski-Wise model was used to detect the expected difference in college attendance with and without the Pell Grant program for 1979-80. The main finding of this model was that Pell Grant had a substantial impact on access. The estimated model enrollments were 21% higher than had Pell Grant not been in existence. Manski and Wise, as quoted in McPherson and Schapiro (1991), stated that the strongest incidence of an enrollment increase was for lower-income students at 59%, with middle-income students at 12% and higher-income students at 3% (p.20). A similar study developed by McPherson and the Brookings Institute examined the relationship between enrollment rates and net prices for gender and income groups. Their findings were the same as those of the Manski-Wise study.

Richard Schrubb (1991), in his dissertation on The Relationship Between Student Financial Aid and Undergraduate Persistence, found that

> 1) the total influence on financial aid and selected student characteristics does have an influence on the length of time a student persists. The only area in which the combination of all the variables does not relate to student persistence is when the students did not graduate are being tested . . . and
>
> 2) financial aid is not related to persistence when limited to the students who graduated. This suggests that financial aid is more of an aid to graduation than it is to persistence. (p. 115)

The results indicated a relationship between financial aid and persistence only in the category of grants and only among students who graduated.

A 1979 Carnegie study suggested that the role of student aid in maintaining enrollment was apparent by the number of students who indicated withdrawal from college for financial reasons, dropping from 25% in a 1968 study by Astin to 5% in a 1980s Higher Education Institute Report (Carnegie Foundation, 1979). However, Davenport (1991) pointed out in his dissertation that other variables might account for persistence in college. These variables include parental education level, high school college track programs, enrollment at an in-state university, full-time employment, and enrollment in a nonselective institution. Pascarella (as cited in Davenport, 1991) said that

> what happens to a student after arrival on campus may have a greater impact on persistence than either the background characteristics or personal commitments to the institution and the goal of graduation brought to the college. (p. 33)

Citing other factors such as student preparation for college and family background in a report to the Government Accounting Office Blancette (1994), also concluded that there are other important predictors of dropout probability.

Terkla (1984) wrote that "college withdrawal is best understood within a framework in which different variables interact to produce or prevent withdrawal from college" (p. 7). In her analysis she stated that

> the financial aid variable, which is of particular importance because it is the one variable that can be manipulated and is the primary focus of many policy decisions, had the third strongest direct effect on persistence, and the fifth strongest total effect on a student's decision to either remain in higher education institutions or withdraw. (p. 13)

Additionally, Davenport (1991) detailed results of two studies done by Voorhees in 1985 and Hochstein and Butler in 1983, which found that financial need has a large direct negative effect on persistence and that when comparing financial aid packages, grants have a larger positive effect on retention and persistence. Davenport's (1991) study also indicated that there were no statistically significant differences between graduation rates of entering dependent students despite receiving different financial aid packages.

Writing in the Economics of Education Review in 1988, Stampen and Cabrera stated,

> What do we know about the effects of aid on persistence, however it is measured? Lacking are standards telling us what to expect in terms of effects of aid on the persistence of recipients as compared to nonrecipients. . . . The guidelines are reasonably clear in their intent to eliminate barriers to persistence. We also know that finance is only one of the many variables affecting persistence. (p. 154)

Several research articles, including Murdock's (1989) report that financial aid is having a positive persistence effect on students receiving those funds, especially lower-income students, and is achieving its objective of equal educational opportunity by enabling lower-income students to persist at a level almost equal to that of middle- and upper-income students. However, it is also important to note, as did Mortenson (1988), that with the changes in the Pell Grant program under the 1978 Middle Income Student Assistance Act, those lower-income students also had to compete with middle-income students for a correspondingly smaller piece of the pie. "What Congress intended to be as more inclusive aid for all Americans simply meant more of a dilution for disadvantaged students" (Hauptman, 1994, p. 130). But perhaps it is important to remember as Murdock (1989) also wrote,

> The meta-analysis showed that financial aid had a "less than small" effect on student persistence, and, other variables of stronger influence may be operating on student persistence. . . . It is important to remember that students must gain access to an institution before they can persist, and financial aid is probably a more important equalizer during the entry phase than it is during the exit phase. (p. 12)

Financial aid does seem to affect students' persistence in higher education. However, just how great that effect is on persistence is still being researched and debated. Perhaps there is some greater end than the mere fact that more students access college education. "We have fallen into the habit of equating the issue of aid effectiveness with measures of the effect of student aid on the enrollments of low-income students . . . but limiting our inquiry into that first question produces an unreasonably narrow framework for assessing the role and impact of financial aid" (McPherson, 1988, p. 7). Society must look beyond access, through attainment, to production to determine if the return value of the education is worth the cost.

In summary, it does appear from the literature that financial aid has accomplished one of its intended effects--more people are enrolling in higher education. Nevertheless, the literature also seems to indicate that financial aid (i.e., grants) has a significant relationship only with graduation, not persistence. Therefore, understanding how this relationship impacts overall financing of higher education is critical to educational institutions and to the country. Society must examine whether the expenditure of present dollars for financial aid (Pell Grants) supports the potential future return on that investment through the expansion of human capital.

Human Capital Theory

"The word 'capital' generally refers to the reproductive power of natural and man-made producer of goods. Capital resources typically are factors of production which must themselves be produced at some cost and are subject to changing value with use or disuse" (Wykstra, 1971, p. 2). Capital is usually explained as part of an economic theory or in an economic context. "Capital may exist in an intangible form as well as in tangible, traditional forms of factories and machines. Intangible capital may be embodied in people--in labor resources. This would constitute a hybrid class of productive resources--a combination of labor and capital which might be called *human capital*" [emphasis added] (Weisbrod, 1971, p. 70). Schultz (1982) said,

> Education is a personal, acquired ability. It is unique in the sense that once you have it, no one can take it from you. Nor can you get rid of it! We call this acquired ability "capital" because it renders valuable services and it entails investment. We call it human capital because it is embodied in human beings. (p. 39)

The concept of human capital is not a new idea. However, it has undergone expanded analysis in the twentieth century.

> Concerned with economic losses from the London plagues Petty estimated the value of an Englishman's production, the extra probability of his death if he remained in London, and the cost of transportation from the city. He then concluded that an expenditure to move people--and thereby to save lives--would indeed be a financially wise investment. The return would be eighty-fold. (Weisbrod, 1971, p. 70)

"Some classical economists recognized that human beings received inadequate amounts of education for the total welfare of the state as well as for the individual" (Wykstra, 1971, p. 3). However, most were oriented toward economic wealth and development. There were few times over the past 100 years when economists outwardly supported the modern notion of human capital. Those that did support the concept defended it by saying that (a) there were costs associated with the development of human capital, (b) the output of skilled workmen added incrementally to the national product, and (c) expenditures which increased the national product also increased the national wealth. However, Wykstra (1971) reported that "the prevailing tradition among economists remained that of recognizing only the standard factors of production-labor and physical capital" (p. 3). The only notable early efforts at understanding human capital theory were S. J. Strumlin's sample of workers in the former U.S.S.R. to measure the rate of return from investment in education and J. R. Walsh's estimate of the present value of returns from a college education (Wykstra, p. 3). The concept of human capital would not become fully incorporated into American thinking until the latter half of this century.

"It was not until the 1960s that an awakening to the real value of human capital actually occurred" (Johns, Morphet, & Alexander, 1983, p. 33). It was at that time that Theodore W. Schultz (1971) first theorized that human capital may be of economic importance to the production process. Schultz believed the investment in human beings generated a form of "human capital" which was important for a nation, economically and socially. However, many people were uncomfortable with Schultz's theory because as he said, "The mere thought of investment in human beings is offensive to some among us. Our values and belief inhibit us from looking upon human beings as capital goods, except in slavery, and this we abhor" (Schultz, 1971, p. 24). However, he believed that human beings should be counted as a source of wealth and that an investment in their education, as a positive intervention by government, was an investment in the future. McKeown and Alexander (1986) stated,

> A product or service is placed in a consumption category if it yields satisfaction (or utility) in a single period only. On the other hand, a good is placed in the investment category if it is expected to yield satisfaction in future periods only. (p. 191)

"Increased investment in education, whether public or private, has certain economic benefits and can be thought of as yielding a social rate of return on the investment" (Morgan & David, 1971, p. 178). These economic benefits can be thought of as a return to society in such ways as (a) a better and more productive work force, (b) a more informed electorate, and (c) a society wherein its citizens can better enjoy the life and culture of the country. It is assumed that individuals with more education enjoy a higher income and correspondingly are able to enjoy more free time, which permits them to savor the fruits of their economic labors. Even more broadly, an investment in human resources can be thought to improve the nation in other ways, such as improved health. "It goes without saying that a nation of people suffering from hunger and poor health will not be economically productive. . . . Advancements in health generally extend the productivity of one individual and make any investment in education longer lived and more rewarding" (Johns et al., 1983, p. 37).

Schultz believed that human resources had both quantitative and qualitative dimensions. The number of people, the percent of those who enter the work force, and the work hours of the labor force were essentially the quantitative aspects of human resources. The qualitative aspects of human capital, according to Schultz, are "skill, knowledge, and similar attributes that affect particular human capacities to do productive work" (Schultz, 1982, p. 32). However, Schultz was not the only one to believe that human capital was an important component of any country's economy. Johns et al. (1983) quoted Frederick H. Harbison as saying, "Human resources--not capital, nor income, nor material resources--constitute the ultimate basis for the wealth of nations" (p. 35). Schultz believed that expenditures made to enhance such capabilities would also increase the productivity value of human efforts, and hence they would yield a positive rate of return. Weisbrod (1971) said that "human capital represents resources which man has utilized to augment his personal productivity" (p. 71).

The question for Schultz and others was how to gauge the magnitude of such human investment. In the production of physical capital, the formula is as simple as to estimate the capital formation made to produce such goods. However, a corresponding problem for the estimation of human capital is how to distinguish between expenditures for consumption and for investment. Schultz (1971) said,

> We can think of three classes of expenditures: expenditures that satisfy consumer preferences and in no way enhance the capabilities under discussion (sic human capital theory)--these represent pure consumption; expenditures that enhance capabilities and do not satisfy any preferences underlying consumption--these represent pure investment; and expenditures that have both effects. Most relevant activities clearly are in the third class, partly consumption and partly investment, which is why the task of identifying each component is so formidable and why the measurement of capital formation by expenditures is less useful for human investment than for physical goods. (p. 33)

Investment Versus Expenditure

Whereas it is traditional to speak in terms of expenditures for costs related to education, it may now also be necessary to speak in terms of investment in the same breath. Schultz suggested that the best way to measure the investment in human capital is by the estimation of yield rather than by its cost. Schultz (1971) said that "while any capability produced by human investment becomes a part of the human agent and hence can not be sold, it is nevertheless in touch with the marketplace by affecting the wages and salaries the human agent can earn" (p. 33). Thus, the resulting increase in earnings by the individual is the yield on the investment.

Generally, there are five areas that most human capital theorists say improves human capabilities and hence should be thought of in terms of both investment and expenditure. Schultz (1971) suggested that the following five areas should be considered in that light: (a) health facilities and services, which affect the life expectancy, strength, stamina, and vitality of people, (b) on-the-job training, such as apprenticeships, (c) formal educational training, such as elementary, secondary, and postsecondary schooling, (d) study programs for adults, and (e) migration of individuals to adjust to changing job opportunities. Each of these particular areas have "costs" associated with them. Specifically for education, some of the more generally recognizable costs are (a) salary and benefit costs of teachers, librarians, and administrators, (b) costs of maintaining and operating the physical plant, and (c) interest on the purchase costs of physical plants. Schultz also argued that foregone earnings by students constitute another component of total costs of education, as much as one-half of the cost of higher education.

According to Schultz, investment in education is an important key to understanding the mysteries of economic growth in the United States. Schultz (1971) estimated that "the stock of education in the labor force rose about eight and a half times between 1900 and 1956, whereas the stock of reproducible capital rose only four and a half times, both in 1956 prices" (p. 36). Schultz's statistics showed that even at the lower estimate limits, the return to increased education has been similar to that of the return to nonhuman capital. Harbison, as cited in Johns et al. (1983), said, "The wealth of nations should not only be measured in terms of gross national product, national income and gross domestic product, but also reflect what should be the primary objective of national economic policy, the stock and condition of human capital" (p. 36). Johns et al. (1983) said that beyond the absorption or consumption aspect, a nation's economic output is a function of the infrastructure it has developed and the skill of its people (p. 36).

Both society and the individual benefit from education. According to McKeown and Alexander (1986), private benefits are those benefits that accrue to the individual being educated. Social benefits include private benefits as well as those benefits that accrue to other members of society. They continued by saying,

> There are basically two types of benefits that belong in the social but not in the private domain. These include 1) tax payments associated with the educational benefit (that is, income

> taxes paid out of one's lifetime income stream) and 2) "external" benefits, which are those benefits that are due to the educational investment but that the individual can not capture. In practice, the difference between social and private benefits amounts to tax payment that, although a part of the individuals earnings, represent a portion of society's return to education. (p. 193)

Human Capital and the Benefits to Society

While measuring the benefits to society gained by public support of education is not easy, it is important. Thomas Jefferson wrote that no nation could remain both free and ignorant. America has taken that challenge and ridden it into the twentieth century, providing a well-developed system of public education for its citizens from early childhood to college age. Guthrie, Garms, and Pierce (1988) wrote,

> Educating young people is a major responsibility of adult society. At birth children depend on parents for many necessities. . . . This dependence continues for many years, until children have adequate experience and education to function independently in society. Education, of course, is not free. It requires an expenditure of time and resources--which could be used to produce other things valued by society. (p. 44)

However, society has recognized that there are also benefits to educating the masses of individuals that lie within its borders. "The renewed interest in human capital formation that exists today reflects two general concerns of economists and educators: (a) the economic efficiency implications of rapidly growing expenditures in the education industry and (b) the relation of human capital to economic growth and development" (Wykstra, 1971, p. 3). Direct educational assistance to students alone exceeded $30 billion in 1991-92 (Chronicle of Higher Education, 1993) and is still growing. Combining direct assistance to students with additional assistance for buildings and physical plant, it is easy to see why economists would be interested in human capital as it represents a sizeable part of our national economy and is obtained through a myriad of sources.

"Skills and competence are primarily acquired through formal educational systems, designed to transmit knowledge, skills, and techniques" (Johns et al., 1983, p. 36). "Consequently, the efficiency implications of formal education constitutes a focal point in the study of the formation of human capital" (Wykstra, 1971, p. 57). However, not all education can be attributed to formal educational settings. Johns et al. (1983) said that education can be thought to occur in three broad realms: (a) general formalized schooling, (b) vocational training, and (c) learning opportunities provided by employers or other agencies. All of these combine to form the basis for a nation's educational investment.

"Properly conceived, education produces a labor force that is more skilled, more adaptable to the needs of a changing economy, and more likely to develop the imaginative ideas, techniques, and products that are critical to the processes of economic expansion and social adaptation to change" (Weisbrod, 1971, p. 74). In the United States the level of education has been increasing at a continuous and sizeable rate since the mid-1940s. This increasing educational market incurs both inputs and outputs. According to Weisbrod (1971), there are three broad categories of benefits received from an increased education: (a) those that increase production possibilities, such as increased labor skills, (b) those that reduce costs and thereby make more resources available, and (c) those that increase the guardianship of the public welfare through a raised public-spiritedness or consciousness. Guthrie et al. (1988) pointed out that education contributes to economic growth in several ways. "Most importantly is the direct improvement in productivity associated with upgrading labor skills. Workers who can read, write and perform everyday mathematical calculations, or who possess more specialized work skills all produce more efficiently than the uneducated" (Guthrie et al., 1988, p. 48).

Weisbrod (1971) also pointed out that there are intergenerational benefits to formal education:

> When today's students reach adulthood, their children will gain by virtue of the information education received at home. Much learning takes place at home, where the child's attitude toward school is also largely shaped. Better educated parents are more likely to raise children who recognize the value of education, in terms of job opportunities, as well as in terms of cultural opportunities. (p. 80)

Additional benefits accrue to society through employers, who have the benefit of hiring employees who are not illiterate and untrained. The general public benefits in several ways. There are direct benefits of an educated populace since "lack of education leads to employment difficulties and crime, the costs of crime prevention, law enforcement, and social unrest-with (sic) high welfare costs" (Weisbrod, 1971, p. 80). There are also other indirect benefits to society, such as (a) increased literacy, (b) socially desirable attitudes and behaviors, (c) more civic-minded populace, (d) a more informed electorate, and (e) other side benefits which may not be as obvious as the direct benefits.

Hu, Kaufman, Lee, and Stromsdorfer (1971) indicated there are four major reasons a society should support public education. First, it is a community desire, and the benefits of a well-educated citizenry constitute demand for public education. Therefore, it is a public need and as such must be supported. Secondly, it helps to redistribute income. In a market economy, the allocation of the share of the total product is based on the productivity of the resources, the quantity of the resources provided, and the prices of these resources. The result of this system is an unequal distribution of income. Thus, according to Hu et al. (1971), social justice and economic efficiency *require* that this normal allocation be moderated so that lower-income people have an adequate standard of living. Thirdly, it is efficient in its production. They stated that public schools offer economy of scale and therefore are better able to offer a lower average cost than other schools (e.g., private). Fourth, it provides for greater economic stability and growth. Hu et al. (1971) further contend that providing an educated populace allows for fuller employment and individuals who more quickly adjust to the rapidly changing technologies of this and coming centuries.

Guthrie et al. (1988) said that "the public benefits from a student's education in at least two ways. First, one person's education may benefit another person, and secondly, education may improve the social environment of a community, making it a better place for everyone to live" (p. 47). Guthrie et al. (1988) stated that because of the increasing interdependence of the modern industrial and technological society, education helps us work with one another: "A better educated person sets an example. Education may make a person more aware of recent technology, or more flexible in applying new technology or ideas to work situations" (p. 47).

Human Capital and the Benefits to the Individual

Individuals tend to gain from education in both direct and indirect ways. Wykstra (1971) stated,

> Investment in education may generate private benefits by enhancing the earning potential of an individual. This direct benefit may be augmented by other less apparent indirect benefits. Future schooling may enhance future options to acquire even more skills and hurdle certain types of job-

> entry barriers. Some benefits (or costs) may be noneconomic--the case if education broadens one's understanding of the life process or contributes to greater job satisfaction. (p. 14)

Weisbrod (1971) said that direct economic gains to individuals from education come in the form of greater incomes and smaller unemployment rates (p. 76). Weisbrod cites statistical data for both the United States and Canada which point to a positive relationship between an individual's educational attainment, subsequent income, and possible unemployment. Several studies such as Houthakker, Miller, and Becker (as cited in McKeown & Alexander, 1986, p. 194) have shown extraordinarily high private internal returns to public elementary schooling, ranging up to 155%. According to McKeown and Alexander's (1986) research, a dollar of investment in four years of college yields approximately $1.62 and $1.19 in benefits for males and females, respectively. However, "we also need to note that we do not know the extent to which education, as opposed to parental wealth or native ability, are responsible for the positive association between levels of education and income" (Houthakker, 1959, p. 117).

"Economic and educational scholars have also included other individual benefits such as the following: (a) the cultivation and discovery of (potential) talent, (b) the increased capability of people to adjust to changes in job opportunity, (c) better citizenship, and (d) the chance to give the next generation a better chance" (McKeown & Alexander, 1986, p. 191).

Additionally, men and women who receive a higher education and then choose to become homemakers may not receive a direct economic benefit from education but may receive other indirect benefits. Such benefits, according to Guthrie et al. (1988), may be improved familial, cultural, and social opportunities, and enhanced prospects for their children's education. In other words, the economic value of education for those who do not enter the labor market may not be completely lost, if one looks at certain indirect benefits.

Human Capital and Individual and Societal Costs

There are also economic costs associated with a nation's decision to provide for higher education. Students enrolled in higher education sustain many different costs, not all of them purely cash payment costs. Students (or parents) typically are charged tuition and fees, books and supplies, room and board, transportation costs, and a variety of personal expenses during their pursuit of an education. "There are considerable differences between the costs of education assumed by the student (the private cost) and the total costs of education assumed by society (the social cost)" (McKeown & Alexander, 1986, p. 188). Weisbrod (1971) reported,

> Costs include more than cash payments. They also include the earnings and production *foregone*

> because potentially productive people are in school (or in the hospital or physician's office in the case of investment in health), instead of on the job. In fact, a recent estimate for the United States indicates that the costs of high school and college education in the form of foregone income exceed by more than fifty percent the costs incurred directly by the schools. (p. 78)

With the increase in federal expenditures, there are now the additional expenses of supporting students through financial aid assistance while they are in school. These two items represent great economic costs to society. In addition to these economic costs, there also are "psyche" costs to the individual while they work toward educational attainment and delay the gratification from the purchase of goods and services, which others their age may be purchasing.

Human Capital and Private and Public Return

Just as there are benefits to both the individual and society, there are also returns to the individual and society. However, it is sometimes easier to examine the benefits that accrue to individuals and society than it is to examine the returns to them. Guthrie et al. (1986) stated, "According to human capital theory, young people acquire a stock of human capital in much the same way as businesses acquire a stock of physical capital. Acquisition of education has many attributes of an investment" (p. 55).

Economists measure the return of a human capital investment in several ways. McKeown and Alexander (1986) indicated three methods to evaluate return on human investment: (a) determine the increased lifetime earnings, (b) calculate the net present value of college education, or (c) calculate an internal rate of return. There also are other ways to estimate the stock value of human capital. Schultz (1963) summed past expenditures on education and then adjusted it for a variety of intervening factors, such as length of school year. Alternatively, economists can discount future earnings capacity in arriving at an estimate of the human capital stock.

> The discounted earnings approach raises numerous unresolved issues including future mortality, the implied assumption that earnings reflect marginal productivity, the proper rate of discount, and the treatment of human capital appreciation or depreciation. The production cost approach also raises difficulties that require careful consideration. Such difficulties include the extent to which costs of education constitute investment rather than consumption expenditures and the appropriateness of foregone earnings as a cost component. . . . For this reason it is important to remain cognizant of the limitations of measuring human capital stocks. (Wykstra, 1971, p. 5)

"The residual or production approach to analysis of human capital consists of delineating the form and magnitude of relations between inputs (labor and capital), outputs (national income), and whatever unexplained growth in output might remain" (Wykstra, 1971, p. 5). This method is limited in that there are connections between technology and physical factors of production that remain unidentified and give a residual effect which remains unexplained.

Return Methodologies

Wykstra (1971) stated that there are three broad methodological approaches to determining cost and return comparisons. All of these approaches assume that decision making and resource allocation are based on the premise that resources are allocated in the most optimally efficient manner possible. All methods have positive and negative aspects to them. The optimum benefit method is attained when marginal benefits are equal to or greater than marginal costs, subject to no budget constraints. If budget constraints do exist, then benefits are proportional to costs. In this method, it is important to identify and fully measure all costs and benefits.

Present Value Approach

This approach is to analyze increases in lifetime earnings that are associated with additional earning capacity. Typically, data are collected on incomes of individuals with different educational attainment levels. This estimate of lifetime earnings is then discounted by some assumed interest rate to obtain present values, which is then compared to the present value of income of specific categories of individuals, i.e., college graduates.

Benefit-Cost Ratios

Another method is to look at the ratio of gross benefits to costs. If the return is at least equal to costs, then a benefit may be determined. Discounting is appropriate in these cases, and the rule is to invest in a program if, after discounting the benefit to the cost, the return benefit is at least equal to costs.

Internal Rate of Return

This method is very similar to the present value approach. The internal rate of return is the most popular comparison basis when comparing human capital (Wykstra, 1971). This method calculates the internal rate of return, which is expressed as a percentage that can be compared to any interest rate that is representative of the social opportunity costs of public capital. The rate of return equates the present value of costs and benefits (Wykstra, 1971). In short, the internal rate of return is a discount rate that equates the present values of benefits to costs. "The decision criterion is to select programs yielding the highest relative 'r,' wherein 'r' equals the rate of return, provided that 'r' exceeds the social opportunity cost of public capital" (Wykstra, 1971, p. 17). "The higher the expected increments of income and the lower the costs of education, the higher the rate of return. Differing amounts of education can then be compared in terms of their merits as investment" (Guthrie et al., 1988, p. 55). McKeown and Alexander (1986) estimated that the private rate of return for four years of college occurs in the range of 10% to 15%.

Society, the Individual, and Investment Returns

Schultz and Freeman, as cited in Guthrie et al. (1988), contended that the rate of return for college education is lower than that for elementary or high school. Schultz said that there is a serious underinvestment in elementary schooling, but there is greater controversy about increased investment in higher education.

This research examined these questions in more detail by studying the relationship between financial aid (specifically the Pell Grant) and increased income (productivity). Statistical evidence can help society continue to support students, by providing sources of aid which help them reach higher education, persist through to attainment, and become productive citizens of the country.

"The total economic cost of higher education includes the potential earnings of the student foregone by the family, which are represented approximately by the room and board costs often borne by the student and his parents" (McMahon, 1987, p. 135). The cost of higher education includes not only the use of funds provided by the federal government (Pell Grants) but also the foregone income lost by a student (and subsequently the nation through lack of taxes, productivity, etc.). Therefore, it is of special interest to society that the monies used to help students in funding their college education not only helps them to persist but ultimately help them to produce.

"Several people have suggested that the entire system needs to be revamped, perhaps with a universal revolving fund that is neither loan nor grant but rather a repayable income-contingent system" (Byron, 1989, p. 26). Some economists and politicians have stated that financial aid must be held to some purely black-and-white standard of accountability, and understanding the numbers of completers is important when considering whether a financial aid program is working. Others including Manski (1988) have said that lowering dropout levels would not necessarily make society better and that student aid policy not be evaluated by its effect on dropouts.

However, whatever we do, we need to express that societal discussion in terms that are meaningful to society and to individuals. One of the many questions to be answered, as the literature suggests, is whether the loss of *financed dropouts* (students who receive Pell Grants but subsequently drop out) is merely a cost of doing business. Perhaps the subsequent increased taxation of those who do produce is sufficient for all those who do not produce more. We will see, as Cappelli and Iannozzi (1991) wrote, "that research has shown that even one year of schooling, with or without a credential, raises a person's wages" (p. 2).

The question of this research was whether there are sufficient returns to society from students who have received Pell Grants. However, it is with some difficulty that the return to society can be determined. Guthrie et al. (1988) said that, "economic growth, social understanding, and political stability are likely outcomes of public education" (p. 62).

Are the mathematical estimates of the social rates of return, which are generally less than the private (individual) rates of return, enough to determine this benefit? "Estimates for the social rates of return are somewhat less, yielding approximately 11% to 13%" (McKeown & Alexander, 1986, p. 198). Given that there are individual and societal costs and benefits to a government and a taxpayer citizenry, it is important that society understands those costs and benefits.

Like other types of financial assistance, the Pell Grant program, established in 1972 as the BEOG program, was to provide access to higher education. The original intent of the program, according to Boren (1989), was to help equalize educational opportunity across income classes (p. 23). In 1980 the U.S. Senate, in an accompanying report to the 1980 Education Amendments, added,

> That the BEOG program was enacted in 1972 to serve as a floor for federal programs for student assistance. Its basic premise was that students should not have to make choices among postsecondary educational institutions on the basis of where student financial aid was available. (Boren, 1989, p. 23)

The literature says that financial aid was established to grant access to institutions of higher learning, which ultimately leads to better jobs and hence better income. This assumption seems warranted in that access without accomplishment seems unjustified when spending $21 billion a year, given there are other worthy ways in which the government can spend its money. "The occupational, monetary, and other societal rewards to higher education are in large part conditional on earning a degree" (Manski & Wise, 1983, p. 10). It seems reasonable in the awarding of financial aid to expect that students eventually will complete their education and obtain employment which produces a better benefit for themselves and for society than before the education was obtained.

"A key question about all training institutions and programs is, what difference do they make? Training is ultimately supposed to help people get better jobs at higher pay than they would without it. . . . With the exception of major second-chance programs, which have been increasingly subject to formal evaluations based on experimental designs, surprisingly little effort has been directed at assessing the results of postsecondary training" (Hansen, 1994, p. 73).

It seems that higher education, Americans and taxpayers, need to know that the Pell Grant program is providing additional benefits to students that help increase their future individual and societal value. Mangum, as quoted in Hansen (1994), said that "at its root, training is an act of faith. The evidence we have does not call this faith into question, although it is often insufficient for a ringing endorsement of training's benefits" (p. 76).

However, how do we know that the Pell Grant is providing the means necessary for students to obtain additional value?

> Like trial and error in the job market, postsecondary education may for many young people be part of the search process that leads to discovery of what they like and don't like and of which occupations are compatible with their interests and abilities. To this extent, students may derive information value from attendance, even if they drop out. And, of course, traditional benefits in the form of learning are not entirely lost just because a student drops out before obtaining a degree. (Manski & Wise, 1983, p. 10)

"The available data indicate that large fractions of students who enroll in community colleges and proprietary schools fail to acquire any credentials--either associate degrees or certificates--and that many of these students complete very few courses" (Hansen, 1994, p. 77).

Part of the problem in understanding whether the Pell Grant program is working is in the application of definitions. "An issue very important to research is the appropriate definition of a dropout used. The definition of dropout employed will influence the results of any analysis. Unfortunately, there is no universally accepted definition for 'dropout or attrition'" (Terkla, 1984, p. 2). Community colleges offer students the opportunity to obtain training that meets their individual needs. Many community college students, though not completing a degree or certificate, have obtained the training they wished. They are not necessarily dropouts but completers of their own training plan" (Hansen, 1994, p. 77).

"Financial aid recipients must be working toward a degree or certificate, and eligibility for a Pell Grant ceases upon completion of those degree requirements" (Boren, 1989, p. 7). Therefore, it is implied that the desired end value is the attainment of a degree, which promotes subsequent employment because of the degree. A student who does not obtain employment with more human capital production value than before the federally financed educational experience may not be considered a positive producer if the most conservative definition of "completer" is used. The literature indicates that limited education may have a benefit to the individual and to society. This research examined the financial benefits to society and the individual students who completed the AS degree in the spring of 1994 after using federal Pell Grant funds.

CHAPTER 3
METHODOLOGY

General Research Design

This research examined the investment return to society and the individual for Pell Grant students from selected Florida community colleges who received an A.S. degree in 1994. Specifically, the problem was addressed by answering the following questions: 1. How much Pell Grant money is used to fund educational opportunity for individuals who earn AS degrees in Florida community colleges?

2. Will the difference between the taxes computed over the work expectancy on pre-A.S. degree wages and post-A.S. degree wages be equal or greater than the Pell Grant investment?

3. How long does it take to repay the Pell Grant investment after the student has graduated from the A.S. degree program?

4. Are there differences in payback potential among the programs of study for an AS degree?

5. Do students who receive Pell Grant funds receive more income after graduation from their program than before completion of the degree?

6. Is there a difference between pre- and post-training income among the different programs of study?

To determine the societal investment return, the amount of total Pell Grant funds received was compared to the total present value of taxes paid over the student's expected work life. To determine the individual's investment return, pre- and post-AS-degree wages were compared.

The amount of "value added" taxes generated from students who received Pell Grant funds was determined by comparing post-AS-degree wage, and the expected salary without the degree. These two wage distributions were used to determine an estimate of the difference in the present value of taxes paid over the average of the individual's expected work life. The estimate of taxes paid was compared to the total amount of Pell Grant funds awarded to determine the return on society's investment in this study group.

To determine if there is a significant difference between the salary earned pre- and post-AS degree, the 1991 annualized salary was compared to the 1994 annualized salary. The pre- and post-AS salary differences between different degree programs were determined to see if any significant differences exist. The study used the annualized data for the fourth quarters of 1991 and 1994 for each student to compare the individual programs' pre-AS-degree earnings against the post-AS-degree earnings.

Study Participants

Three Florida community colleges participated in this study. These community colleges are geographically located in north, central and south Florida. While these colleges may not be representative of all community colleges, the data provided was adequate for estimating costs of Pell Grants for students earning AS degrees as well as estimating the needed payback levels.

Student Data

These three community colleges provided the following data on their alumni who were awarded an AS degree in the spring of 1994:

(a) Social security number
(b) Program of study
(c) Student birth date
(d) Amount of Pell Grant funds awarded
(e) Date program of study began

Students' social security numbers were matched to the State of Florida Department of Labor employer reports to obtain wages earned during the fourth quarter of 1991 and the fourth quarter of 1994. Matched records provided pretraining and posttraining wages for each student included in the study. Records of social security numbers that did not match both 1991 and 1994 quarters were excluded from the study. It was assumed that disqualifying these students would not affect the results significantly since they were likely to be wage-earners in situations not available for inclusion in the Florida Department of Labor wage database. Students who matched one but not both wage quarters were included in the study. It was assumed that these students were working at least at the minimum wage level. The study included an annualized minimum wage rate for those students. The 1994 fourth quarter was assumed be the most likely first complete quarter in which this population might show income earned after degree attainment.

Definition of Payback

Payback is defined as the increase in monetary benefits to society and to the individual resulting from the Pell Grant investment. Students' incomes, before earning an AS degree, were considered incomes available through "no investment" of further education. To determine payback, distributions of wages based on the "no investment" and "Pell investment" assumptions were computed. The estimated income tax on each distribution was determined. Payback, then, is the difference in the present values of the estimated distributions of all forms of income tax paid.

In a special report, Fleenor (1995) stated that the typical single wage-earner in 1994 paid 36% of his/her income in combined federal income and state and local taxes, while the two-earner married couple paid 38% of their income in total taxes (p. 4). For purposes of this study, Fleenor’s single wage-earner percentages were used to calculate payback to society.

The expected number of years to earn wages (work span) was defined for both distributions of income. For the "Pell investment," work span was defined as the difference between retirement age and graduation date. The "no investment" work span was defined as the difference between pre-AS degree wages (annualized 1991 earnings) and retirement age. For the purposes of this study, it was assumed that AS degrees will enhance earnings until retirement. Age 63 was the assumed age of retirement for purposes of this study since age 63 represents a midpoint between the earliest Social Security retirement age of 62 with reduced benefits and the full benefit age, which is currently age 65.

Present Value Formula

To obtain the present value of wages, the following formula was used:

$$\text{Present value} = \sum_{N=1}^{X} [\{(\text{base salary}) \text{ X } (z+p)^n \text{ X} (\frac{1}{(1+r)^n})\}$$

where X is the number of years worked beginning with N=1, z is the long-run inflation factor, p is the productivity factor, and r is the discount rate.

Qualifying Students for the Study

There may be many reasons why a student’s record of wages earned did not appear on the Florida Department of

Labor wage database. Some disqualifying reasons may be self-employment, unemployment, moving out of state, or military or other national service. For this study, any student for which there was no match between the fall 1991 and 1994 fourth quarter wages database was not included.

Treatment of the Data

The wages earned by each individual student were combined to compute two different distributions, one to represent expected earnings for "no investment" and one to represent "Pell investment" of the study group. The "no investment" distribution projected the wages earned before the federal educational investment over an estimated work span. Similarly, a second distribution was generated on wages earned after investment. The study group also was used to determine the mathematical mean age of the group in order to calculate the number of years to retirement.

Types of Investment Payback

Societal Payback

The estimated monetary return to society was determined by comparing the current value of all taxes paid over the working life of the study group to the value of Pell Grant monies actually received by the study group while earning their AS degrees. To determine this current value benefit to society, the differential between pre- and post-AS-degree taxes paid were computed for the work life of the study group. A "taxes paid" figure was determined by computing the total work-life earnings for the study group, based on 1994 fourth quarter earnings, and projecting those wages through the age of retirement to determine total aggregate annual wages for the study group. The annual taxes owed were calculated based on Fleenor's respective 36% of taxes paid each work year and then totaled to determine an aggregate taxes paid amount. This aggregate amount was compared to a similar calculation to determine taxes paid for pre-AS-degree earnings. The difference between both sets of taxes paid figures is the estimated increase in societal benefits attributable to the increased wages earned by completing the AS degree.

The research estimated a range of taxes paid by assuming two federal tax methodologies. The first method is that the study group are "single taxpayers" with no dependents. The second method is that the taxpayer has two dependents. Tax rates were computed based on both methodologies. The total of all taxes paid by the post-AS-degree study group were then compared to the total amount of Pell Grant funds awarded to the study group for receipt of an AS degree. The amount of the aggregate Pell Grant award was determined based on information provided by the three Florida community colleges. The tax information was assumed to hold true for any future calculations.

Individual Payback

Individual payback is assumed to be in the form of increased individual earnings. This research determined the difference between pre- and post-AS-degree wages based on 1991 and 1994 fourth quarter earnings as reported by the Florida Department of Labor. The difference between the two respective annualized fourth quarter earnings is the potential payback to the individual.

Societal Benefits by Category

A table of total value-added taxes by age group and occupational classification was constructed to determine what effect those variables have on the increased benefits to the individual and society. The average Pell Grant award is the cumulative sum of all Pell Grants awarded at the community colleges in which the AS degrees were awarded.

Payback Assumptions

The payback to the taxpayer and society is based on several assumptions: 1. beginning initial salaries may be lower at the onset of initial employment; however, they will follow the same pattern as the U.S. gross national product and therefore can be used as an indicator of the break-even point, 2. Pell Grant recipients who obtain the AS degree will seek immediate employment upon graduation, 3. students with no Florida Department of Labor database match for 1991 and 1994 fourth quarter earnings were unemployed or unavailable for employment, employed out of state, or

otherwise unavailable for inclusion in the database, 4. the assumed percentage of total taxes payable by an individual are representative of total taxes in the future, and
5. students without Pell Grant funds would not have higher education opportunities available to them and therefore would not have received the additional schooling necessary to obtain value-added schooling.

CHAPTER 4
RESULTS

The purpose of this research was to determine the relationship between the expenditure of Pell Grant funds and the monetary benefits derived for society and the individuals who received those funds. Wystra (1971) stated that "much of what we call consumption constitutes investment in human capital. Direct expenditures on education and health . . . are clear examples."
Cohn and Geske (1986) reaffirmed that same principle as they stated,

> From an economic perspective, investments in human capital formations, such as formal education, can be evaluated on the basis of their ability to generate future returns in terms of additional income and greater personal satisfactions. (p. 183)

This research answered the following specific questions: 1. How much Pell Grant money is used to fund educational opportunity for individuals who earn AS degrees in Florida community colleges?

2. Will the difference between the taxes computed over the work expectancy on pre-A.S. degree wages and post-A.S. degree wages be equal or greater than the Pell Grant investment?

3. How long does it take to repay the Pell Grant program investement after the student has graduated from the A.S. degree program?

4. Are there differences in payback potential among the programs of study for an AS degree?

5. Do students who receive Pell Grant funds receive more income after graduation from their program than before completion of the degree?

6. Is there a difference between pre- and post-training income among the different programs of study?

Results of the Study

Three Florida community colleges participated in this research. Each college provided data for their spring 1994 AS-degree graduates. The data for each graduate included the amount of Pell Grants, social security number, total amount of Pell Grant funds awarded through receipt of the AS degree, birth date, and the particular classification of instructional program (CIP) code. The CIP is a standardized coding schema that institutions of higher education use to classify specific instructional programs.

Each college provided a listing of all spring 1994 AS graduates, including those who received Pell Grant funds. The three community colleges, Lake City Community College (LCCC), Santa Fe Community College (SFCC), and Indian River Community College (IRCC) each supplied an initial listing that contained combined data for 261 students (LCCC, 80;

IRCC, 86; and SFCC, 95). The social security numbers provided by the colleges were then submitted to the Florida Education and Training Placement Information Program (FETPIP) to access Department of Labor databases.

The FETPIP ran these social security numbers through their labor-wage database and returned 1991 and 1994 fourth-quarter wage information on 141 Pell Grant students. Twenty-one social security numbers were returned as invalid numbers. These invalid numbers may have been due to coding errors at the originating educational institution or because the institution used assigned student identifier numbers instead of actual social security numbers. This research determined that some students had missing data when information was pulled from the state's wage database. To include these students in the study, the calculated mean for the group was used for the missing data. The mean pre-AS-degree earnings for the group was $12,778 and the mean post-AS-degree earnings was $26,540. An examination of the data also revealed that the average age of this population was 30.8 years at the time of graduation.

Total Pell Grant Funds

Examination of the data showed that the average Pell Grant award was $3,860. Data obtained from the three community colleges indicated that the range of Pell Grant awarded through receipt of the AS degree was between $65 and $10,687. This top award should be considered suspect, since the average Pell Grant award for the two years prior to and including year of graduation was $2,300 per year. Therefore, this amount may reflect additional training opportunities afforded the student. The total amount of Pell Grant funds awarded to the 100 subjects equaled $385,982.

Returns to Society and the Individual

This research examined the pre-AS-degree earnings for the aggregate group and found that the annualized 1991 fourth quarter earnings was $12,622. This student was assumed to have worked the entire year in 1991 and continued full-time work, while other students may have taken time out to obtain their AS degrees. It was calculated that salaries would increase by 5% per annum through age 63½. Using this scenario and an average student age of 31 years, it was calculated that the total salary earned by this student during the remainder of his/her working lifetime would be $1,073,873. Using Fleenor's (1995) anticipated 36% return in taxes, $386,591 would be returned to society by the time the non-AS graduate would complete his work life.

It was determined through the data set that the annualized salary for 1994 AS graduates was $24,142. This is a difference of more than $10,226 over the non-AS student, who would be making only $13,916 after two years in the work force. Since this research calculated that students would be enrolled in college full-time, there are two years of foregone income that would have to be attributed to that group. The non-AS graduate would have earned $25,875 in total income while the AS graduate was in school. However, this research indicates that the AS student would have "retrieved" all foregone income by the end of the third full work year, and actually slightly surpassed the foregone earnings that year (see Table 2).

Table 2. Foregone Earnings (in U.S. Dollars)

Yr	Pre-Inc.	Post-Inc.	Ann. Diff.	Agg. Dif.	Catch-Up
1*	12,622	0	12,622	12,622	
2*	13,253	0	13,253	25,875	
3	13,916	24,142	-10,226	15,649	10,226
4	14,612	25,349	-10,737	4,912	20,963
5	15,343	26,616	-11,273	-6,361	32,236

*Year 1 and 2 are periods during which nonmatriculated students would be in the workplace earning income.

Table 3 shows the salary and taxes-generated calculations for non-AS-degree students. Table 4 displays the salary and taxes-generated calculations for students who received the AS degree.

One of the questions asked in this study was whether the increase in total federal taxes was sufficient to justify the expenditure of Pell Grant funds. As can be seen in Tables 3 and 4, there is a large spread between the amount of taxes generated by the pre- and post-AS-degree students. The pre-AS student will generate $386,592 in tax revenues during his or her estimated work life. The post-

Table 3. Pre-AS-Degree Earnings and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	12,622	12,622	4,543	4,543
2	13,253	25,875	4,771	9,314
3	13,916	39,791	5,010	14,324
4	14,612	54,403	5,260	19,584
5	15,343	69,746	5,523	25,107
6	16,110	85,856	5,800	30,907
7	16,916	102,772	6,090	36,997
8	17,762	120,534	6,394	43,391
9	18,650	139,184	6,714	50,105
10	19,583	158,767	7,050	57,155
11	20,562	179,329	7,402	64,557
12	21,590	200,919	7,772	72,329
13	22,670	223,589	8,161	80,490
14	23,804	247,393	8,569	89,059
15	24,994	272,387	8,998	98,057
16	26,244	298,631	9,448	107,505
17	27,556	326,187	9,920	117,425
18	28,934	355,121	10,416	127,841
19	30,381	385,502	10,937	138,778
20	31,900	417,402	11,484	150,262
21	33,495	450,897	12,058	162,320
22	35,170	486,067	12,661	174,981
23	36,929	522,996	13,294	188,275
24	38,775	561,771	13,959	202,234
25	40,714	602,485	14,657	216,891
26	42,750	645,235	15,390	232,281
27	44,888	690,123	16,160	248,441
28	47,132	737,255	16,969	265,410
29	49,489	786,744	17,816	283,226
30	51,963	838,707	18,707	301,933
31	54,561	893,268	19,642	321,575
32	57,289	950,557	20,624	342,199
33	60,154	1,010,711	21,655	363,854
34	63,162	1,073,873	22,738	386,592

Table 4. Post-AS-Degree Earnings and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	24,142	24,142	8,691	8,691
2	25,349	49,491	9,126	17,817
3	26,616	76,107	9,582	27,399
4	27,947	104,054	10,061	37,460
5	29,344	133,398	10,564	48,024
6	30,811	164,209	11,092	59,116
7	32,352	196,561	11,647	70,763
8	33,970	230,531	12,229	82,992
9	35,669	266,200	12,841	95,833
10	37,452	303,652	13,483	109,316
11	39,325	342,977	14,157	123,473
12	41,291	384,268	14,865	138,338
13	43,356	427,624	15,608	153,946
14	45,524	473,148	16,389	170,335
15	47,800	520,948	17,208	187,543
16	50,190	571,138	18,068	205,611
17	52,700	623,838	18,972	224,583
18	55,335	679,173	19,921	244,504
19	58,102	737,275	20,917	265,421
20	61,007	798,282	21,963	287,384
21	64,057	862,339	23,061	310,445
22	67,260	929,599	24,214	334,659
23	70,623	1,000,222	25,424	360,083
24	74,154	1,074,376	26,695	386,778
25	77,862	1,152,238	28,030	414,808
26	81,755	1,233,993	29,432	444,240
27	85,843	1,319,836	30,903	475,143
28	90,135	1,409,971	32,449	507,592
29	94,642	1,504,613	34,071	541,663
30	99,374	1,603,987	35,775	577,438
31	104,343	1,708,330	37,563	615,001
32	109,560	1,817,890	39,442	654,443

AS-degree student will generate approximately $654,443 in anticipated tax revenue. The difference between these the pre- and post-AS degree amounts is $267,851, or an actual dollar increase of 169%.

Because Pell Grant students receive their funds while in school, and because payback is calculated over time, it was necessary to conduct a present-value calculation to determine whether the future additional tax dollars was sufficient to offset the present day expenditure of federal funds. In calculating the present value, the number of years used in the calculation was 32, since that is the number of years to retirement, and various discount rates can be assumed. The additional tax revenue is $267,851, and using a present-value calculation with an assumed 5% discount rate means the present value would be $56,213. This represents an investment return of nearly 15 times the amount actually expended for Pell Grant funds.

Table 5 displays the different assumed discount rates based on the expected work life of the individual student. This table shows that even with a high discount rate, students working full time for the expected work life return nearly three times the funds expended by the Pell Grant program in their behalf.

Table 5. Present Value Calculations Over Work Life

Value-Add Taxes	Assumed Discount	Present Value
267,851	1	194,809
267,851	3	104,016
267,851	5	56,213
267,851	7	30,734
267,851	9	16,992

While there are no current age restrictions for the Pell Grant program, the figures in Table 6 are noteworthy in that they demonstrate that students who work full time for two years will have repaid the amount of monies invested in them through the Pell Grant program. However, some of the population may not work the entire 32 years to retirement, as predicated in our analysis. Table 6 illustrates the amount of monies that would be repaid in tax differential dollars if a student worked 1-22 years after receiving the AS degree. Table 7 shows the present value of the tax differential assuming selected years to retirement and assumed discount rates of 1-9%.

One of the questions asked in this study was whether the increase in total federal taxes was sufficient to justify the expenditure of Pell Grant funds. Calculations from this table indicate that students must work at least two years after graduation to return the value of the Pell Grant monies that they received to pay for their AS degrees at selected public community colleges in Florida.

Table 6. Work Years and Tax Payback

Yr	Pre-Tax	Post-Tax	Yr. Diff.	Aggre. Diff.
1	4,543	8,691	4,148	4,148
2	4,771	9,126	4,355	8,503
3	5,010	9,582	4,572	13,075
4	5,260	10,061	4,801	17,876
5	5,523	10,564	5,041	22,917
6	5,800	11,092	5,292	28,209
7	6,090	11,647	5,557	33,766
8	6,394	12,229	5,835	39,601
9	6,714	12,841	6,127	45,728
10	7,050	13,483	6,433	52,161
11	7,402	14,157	6,755	58,916
12	7,772	14,865	7,093	66,009
13	8,161	15,608	7,447	73,456
14	8,569	16,389	7,820	81,276
15	8,998	17,208	8,210	89,486
16	9,448	18,068	8,620	98,106
17	9,920	18,972	9,052	107,158
18	10,416	19,921	9,505	116,663
19	10,937	20,917	9,980	126,643
20	11,484	21,963	10,479	137,122
21	12,508	23,061	10,553	147,675
22	12,661	24,214	11,553	159,228

Differences in Programs of Study

This research also reviewed differences in program majors to determine the effect that the selection of a particular major has on the payback to society and the individual. This research examined each of the program majors represented in the study to determine cumulative income earned and the amount of taxes paid to determine payback to society.

This study examined the pre- and post-AS-degree wages for each program and calculated the cumulative amounts of monies to be earned from employment in each of those major fields during the anticipated work life (32 years).

Table 7. Present Value, Work Years, and Varying Discounts

Yrs	Acc. Tax. Dif.	1%	3%	5%	7%	9%
1	4,148	4,148	4,148	4,148	4,148	4,148
2	8,503	8,335	8,014	7,712	7,426	7,156
3	13,075	12,945	11,965	11,295	10,673	10,096
5	22,917	21,804	19,768	17,956	16,339	14,894
10	52,161	47,220	38,813	32,022	26,516	22,033
15	89,486	77,079	57,438	43,044	32,434	24,567
20	137,122	112,377	75,921	51,680	35,435	24,467
22	159,228	127,923	83,099	54,432	35,940	23,913

The taxes-paid figure was used to determine the present value of taxes paid for comparison to the cumulative Pell Grant awarded. Table 8 shows those calculations for each of the selected majors in the study by selected discount rate.

The following CIP categories are delineated to provide a common name to each major category:

CIP 0101 is a group of agriculture-related majors.

CIP 0317 is a group of health-related careers, primarily technician oriented.

CIP 0318 is a group of health-related careers, primarily registered nursing.

CIP 050 is a group of accounting-related fields.

CIP 061 is a group of business management fields.

CIP 074 is a group of social-services-related fields.

Using the projected 5% discount rate, this research indicated that CIP 0101, agriculture-related majors, returned approximately $81,000 in taxes, more than any other major in the study. Closing in at second position, the CIP comprising primarily registered nurses returned a high present value tax of nearly $78,000. The lowest CIP code, business-management fields, returned $25,000 in present value taxes. The difference between the highest major return and the lowest return was over triple the difference in additional taxes generated.

Table 8. Analysis of Program Payback

	agriculture-related	health-related (technician)	health-related (nursing)	accounting	business management	social services
Category	CIP 0101	CIP 0317	CIP 0318	CIP 050	CIP 061	CIP 074
Ann. Pre	12,778	13,976	14,320	13,816	8,904	10,172
Ann. Post	26,540	22,452	27,992	21,663	13,304	15,636
Cum Pre-Wag	924,592	1,052,350	1,078,329	1,040,448	670,635	766,045
Cum Post-Wa	1,998,462	1,690,772	2,107,793	1,631,189	1,001,804	1,177,406
Pre-Cum Tax	332,850	378,845	388,197	374,561	241,428	275,775
Post Cum Ta	719,446	608,679	758,805	587,228	360,649	423,866
Tax Diff	386,596	229,834	370,608	212,667	119,221	148,091
PV 5% disc	81,133	48,234	77,778	44,631	25,020	31,078
PV 7% disc	44,358	26,371	42,523	24,401	13,679	16,991
PV 9% disc	9,394	14,580	23,510	13,491	7,563	9,394

1) Ann. Pre are annualized pre-AS wages for each category
2) Ann. Post are annualized post-AS wages for each category
3) Cum Pre-Wag are the cumulative pre-AS annualized wages for each category
4) Cum Post-Wa are the cumulative post-AS annualized wages for each category
5) Pre-Cum Tax are the cumulative taxes for pre-AS wages
6) Post Cum Tx are the cumulative taxes for post-AS wages
7) Tax Diff is the total difference between pre- and post-AS taxes
8-10) PV is the present value calculations based on a discount rate of 5%, &% or 9%

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

Conclusion

Geske (1996) said,

> From an economic perspective, investments in human capital formation, such as formal education, on-the-job training and health care, can be evaluated on the basis of their ability to generate future returns in terms of additional lifetime income and greater personal satisfactions. (p. 29)

American society annually expends large sums of monies to assist in the education of its citizenry. This assistance begins at the preschool level and extends all the way through postsecondary education. Educational expenditures of these funds are earmarked for educational assistance, with the Pell Grant and the Stafford Guaranteed Student Loan programs being two of the largest direct support mechanisms for students in higher education. "Because of the magnitude of the federal role in providing student financial aid and its importance in promoting access, questions related to who should receive aid, how much, and in what form are a continuing focus found in federal debates" (Horn & Khazzoom, p. 1). Funding education not only involves cost, but also an element of investment; therefore, society should examine the implications of such investment.

Morgan and David (1971) said,

> Increased investment in education, whether public or private, has certain economic benefits, and can be thought of as yielding a social rate of return on the investment. This societal value of return includes benefits, such as an informed electorate, the greater enjoyment of life and culture, as well as the most obvious benefit of the greater productivity of the educated workers--only the last of these benefits can be measured. (p. 178)

There are many ways in which this return to society could have been measured. In this study, the earnings differential between pre- and post-AS-degree programs was examined to determine if the present value of the additional taxes generated from a higher-paying job repays society for its investment of Pell Grant monies. "Probably the first approach to estimating the pecuniary value of a college education was calculation of an earnings differential. Put simply, how much on average does a college graduate earn in comparison to how much those with less education earn" (Leslie & Brinkman, 1988, p. 41). This study revealed that the earnings differentials were quite substantial between pre- and post-AS graduates in Florida community colleges. Upon calculation of the present value of the taxes paid, based on a 5% discount rate, society was repaid 15 times in additional taxes what it had spent out in investment funds. This study showed that students who earned an AS degree earned twice as much as they would have without the degree. This research supports previous research by Johns et al. (1983) which stated,

> On the average, individuals with a high school education will have higher earnings than those with a tenth-grade education and college graduates will earn more than high school graduates. This pattern has held for many years--in 1939, the average annual earnings of a high school graduate was 64% of the college graduate; in 1949 the figure was 61%; in 1959, 60% and in 1969, 69%. Today [1983] the earnings of high school graduates remains about two-thirds those of college graduates. (p. 42)

The literature indicated that education serves society in many ways. It also serves individuals in that it provides opportunities for students to obtain skills that prepare them for better work. "Education exists because it provides utility. If it did not, there would be no demand for it" (Johne, 1993, p 5).

Statistics indicate that students obtain utility for their educational experiences in that their respective earnings power is increased. Johne (1993) stated,

> In a number of other respects, however education is unusual, first the return to the investment element can easily be measured. Abstracting from the consumption element, we would expect that, other things being equal, the discounted present value of the lifetime earnings would exceed those of less education persons. (p. 6)

The literature indicated that society knows and students expect that education will provide a substantial return on their investment of respective funds and time. McPherson and Schapiro, (1991) reported that

> A wide variety of studies, using different data and sundry statistical techniques, have arrived at fairly similar data estimates of private rates of return to college: at reasonable discount rates, private rates of return exceed the costs of the

> investment and societal returns are usually found to equal or exceed private needs. (pp. 154-155)

The results of this study have shown that society receives a much greater return on its investment, 15 times the amount awarded, than it expended on the funds. These results are consistent with other literature concerned with the fiscal impact of receiving an education. Psacharopoulos (1976) said that "a society rate of return to investment in education results when costs are accounted in full and benefits are accounted gross of taxes" (p. 40). Hu et al. (1971) said, "The optimum amount of public expenditure for vocational-technical and academic education is at the point where the additional benefits from an additional dollar spent on these two educational programs would be equal" (p. 97). This research has shown that investment of Pell Grant funds not only equals the return but far exceeds it. Society, in a variety of ways, not the least of which is financial, receives tremendous benefits from educating its populace. Guthrie et al. (1988) stated the benefits to society in the following way:

> The public, as opposed to a student and his or her family, benefits from a student's education in at least two ways. First, one person's education may improve his or her coworkers' productivity. Second, education may improve the social environment of a community, making it a better place for everyone to live. (p. 47)

Cohn and Geske (1990) pointed out that Schultz, in The Economic Value of Education, was among the first to theorize and acknowledge the important relationship between education and the economic health of a country. The relationship between education and the welfare of a nation includes not only its economic well-being but also its relationship to other major societal concerns. Guthrie et al. (1988) pointed out that two important considerations to receiving an education are the strong relationships between low levels of education and crime and because it serves to maintain social cohesion by reducing social inequalities. Education, as demonstrated in the literature and this research study, shows that investment in education is a good investment.

Hartle and Stedman (1986) said, "The contours and objectives of the federal role are periodically debated and redefined, most often when the Higher Education Act must be reauthorized" (p. 133). However, this research affirms previous studies which suggested that a college education is good for both the country and the individual, especially for the individual who receives Pell Grant funds. This research points to evidence that the federal government should continue to fund the Pell Grant program since it meets its original founding purpose and works to better the country and the individual.

Recommendations for Future Research

This study revealed a large return on the investment of Pell Grant recipients who earned AS degrees at selected Florida community colleges. While the literature supports the idea of good public and private investment returns to society and the individual, this particular return was high. It may be beneficial for other researchers to examine a sample of students of more, or even all, community colleges in Florida to determine if such high rates of return persist across the board.

The federal government plays a crucial role in the partnership between students, parents, and educational institutions in funding higher education. Therefore, it would seem beneficial for the federal government to conduct its own study on a nationwide basis to determine a national rate of return on Pell Grant investments in higher education. Further study and substantiation of these research results could lead to further or increased funding of the Pell Grant program, even in the light of continuing financial shortfalls.

Two additional studies seem to naturally flow as an outgrowth of this research. One would be for recipients of Pell Grants who go on to receive their bachelors' degrees. It would also be beneficial and conducive to further research to understand the relationship between B.A. degrees and societal return on investment. Second, this research concerned itself only with the financial returns to individuals and society. As indicated in the literature, financial returns are not the only returns generated by students who receive Pell Grant funds and who obtain an education because of those funds. Further research into the societal benefits achieved by students who do not complete their intended degree may also shed light on the benefits of funding students whose goals may not be to complete a degree.

However, as Leslie and Brinkman (1988) reported, "College does pay off, in most cases, for the individual who invests in higher education. The payoff typically is quite handsome and is a good deal more handsome than most observers perceive" (p. 8).

APPENDIX A

Human Subjects Research Form

UNIVERSITY OF FLORIDA
INSTITUTIONAL REVIEW BOARD
114 Psychology Building
Gainesville, FL 32611-2250

Harriet S. Hayes

phone: (352)-392-0433
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July 18, 1996

TO: Mr. Hank Dunn
2403 NRN
Campus

FROM: Harriet S. Hayes, Executive Secretary
University of Florida Institutional Review Board

SUBJECT: UFIRB Project #96.354
Financial Returns to Society by Pell Grant Recipients Who Obtain an AS Degree

Funding: Unfunded

The project referenced above has been reviewed by the Chair of the Institutional Review Board. He has determined that only statistical data will be used in this project; therefore, it is exempt from further review by this Board, as no research with human participants is involved. It is our understanding no individual data will not be personally identified.

If a revision of this project should indicate the need for human research participants, please contact this office for additional review.

/h-

cc: Dr. John Nickens

APPENDIX B

CIP TABLE CALCULATIONS

CIP 050 Pre-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	13,816	13,816	4,974	4,974
2	14,507	28,323	5,223	10,197
3	15,232	43,555	5,484	15,681
4	15,994	59,549	5,758	21,439
5	16,794	76,343	6,046	27,485
6	17,634	93,977	6,348	33,833
7	18,516	112,493	6,666	40,499
8	19,442	131,935	6,999	47,498
9	20,414	152,349	7,349	54,847
10	21,435	173,784	7,717	62,564
11	22,507	196,291	8,103	70,667
12	23,632	219,923	8,508	79,175
13	24,814	244,737	8,933	88,108
14	26,055	270,792	9,380	97,488
15	27,358	298,150	9,849	107,337
16	28,726	326,876	10,341	117,675
17	30,162	357,038	10,858	128,533
18	31,670	388,708	11,401	139,934
19	33,254	421,962	11,971	151,905
20	34,917	456,879	12,570	164,475
21	36,663	493,542	13,199	177,674
22	38,496	532,038	13,859	191,533
23	40,421	572,459	14,552	206,085
24	42,442	614,901	15,279	221,364
25	44,564	659,465	16,043	237,407
26	46,792	706,257	16,845	254,252
27	49,132	755,389	17,688	271,940
28	51,589	806,978	18,572	290,512
29	54,168	861,146	19,500	310,012
30	56,876	918,022	20,475	330,487
31	59,720	977,742	21,499	351,986
32	62,706	1,040,448	22,574	374,561

CIP 050 Post-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	21,663	21,663	7,799	7,799
2	22,746	44,409	8,189	15,988
3	23,883	68,292	8,598	24,586
4	25,077	93,369	9,028	33,614
5	26,331	119,700	9,479	43,093
6	27,648	147,348	9,953	53,046
7	29,030	176,378	10,451	63,497
8	30,482	206,860	10,974	74,471
9	32,006	238,866	11,522	85,993
10	33,606	272,472	12,098	98,091
11	35,286	307,758	12,703	110,794
12	37,050	344,808	13,338	124,132
13	38,903	383,711	14,005	138,137
14	40,848	424,559	14,705	152,842
15	42,890	467,449	15,440	168,282
16	45,035	512,484	16,213	184,495
17	47,287	559,771	17,023	201,518
18	49,651	609,422	17,874	219,392
19	52,134	661,556	18,768	238,160
20	54,741	716,297	19,707	257,867
21	57,478	773,775	20,692	278,559
22	60,352	834,127	21,727	300,286
23	63,370	897,497	22,813	323,099
24	66,539	964,036	23,954	347,053
25	69,866	1,033,902	25,152	372,205
26	73,359	1,107,261	26,409	398,614
27	77,027	1,184,288	27,730	426,344
28	80,878	1,265,166	29,116	455,460
29	84,922	1,350,088	30,572	486,032
30	89,168	1,439,256	32,100	518,132
31	93,626	1,532,882	33,705	551,837
32	98,307	1,631,189	35,391	587,228

CIP 061 Pre-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	8,904	8,904	3,205	3,205
2	9,349	18,253	3,366	6,571
3	9,816	28,069	3,534	10,105
4	10,307	38,376	3,711	13,816
5	10,822	49,198	3,896	17,712
6	11,363	60,561	4,091	21,803
7	11,931	72,492	4,295	26,098
8	12,528	85,020	4,510	30,608
9	13,154	98,174	4,735	35,343
10	13,812	111,986	4,972	40,315
11	14,503	126,489	5,221	45,536
12	15,228	141,717	5,482	51,018
13	15,989	157,706	5,756	56,774
14	16,788	174,494	6,044	62,818
15	17,627	192,121	6,346	69,164
16	18,508	210,629	6,663	75,826
17	19,433	230,062	6,996	82,822
18	20,405	250,467	7,346	90,168
19	21,425	271,892	7,713	97,881
20	22,496	294,388	8,099	105,980
21	23,621	318,009	8,504	114,484
22	24,802	342,811	8,929	123,413
23	26,042	368,853	9,375	132,788
24	27,344	396,197	9,844	142,631
25	28,711	424,908	10,336	152,967
26	30,147	455,055	10,853	163,820
27	31,654	486,709	11,395	175,215
28	33,237	519,946	11,965	187,180
29	34,899	554,845	12,564	199,744
30	36,644	591,489	13,192	212,936
31	38,746	630,235	13,948	226,884
32	40,400	670,635	14,544	241,428

CIP 061 Post-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	13,304	13,304	4,789	4,789
2	13,969	27,273	5,029	9,818
3	14,667	41,940	5,280	15,098
4	15,400	57,340	5,544	20,642
5	16,170	73,510	5,821	26,463
6	16,979	90,489	6,112	32,575
7	17,828	108,317	6,418	38,993
8	18,719	127,036	6,739	45,732
9	19,655	146,691	7,076	52,808
10	20,638	167,329	7,430	60,238
11	21,670	188,999	7,801	68,039
12	22,754	211,753	8,191	76,230
13	23,892	235,645	8,601	84,831
14	25,087	260,732	9,031	93,862
15	26,341	287,073	9,483	103,345
16	27,658	314,731	9,957	113,302
17	29,041	343,772	10,455	123,757
18	30,493	374,265	10,977	134,734
19	32,048	406,313	11,537	146,271
20	33,619	439,932	12,103	158,374
21	35,300	475,232	12,708	171,082
22	37,065	512,297	13,343	184,425
23	38,918	551,215	14,010	198,435
24	40,864	592,079	14,711	213,146
25	42,907	634,986	15,447	228,593
26	45,052	680,038	16,219	244,812
27	47,305	727,343	17,030	261,842
28	49,670	777,013	17,881	279,723
29	52,154	829,167	18,775	298,498
30	54,762	883,929	19,714	318,212
31	57,500	941,429	20,700	338,912
32	60,375	1,001,804	21,735	360,649

CIP 074 Pre-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	10,172	10,172	3,662	3,662
2	10,681	20,853	3,845	7,507
3	11,215	32,068	4,037	11,544
4	11,776	43,844	4,239	15,783
5	12,365	56,209	4,451	20,234
6	12,983	69,192	4,674	24,908
7	13,632	82,824	4,908	29,816
8	14,314	97,138	5,153	34,969
9	15,030	112,168	5,411	40,380
10	15,782	127,950	5,682	46,062
11	16,571	144,521	5,966	52,028
12	17,400	161,921	6,264	58,292
13	18,270	180,191	6,577	64,869
14	19,184	199,375	6,906	71,775
15	20,143	219,518	7,251	79,026
16	21,150	240,668	7,614	86,640
17	22,208	262,876	7,995	94,635
18	23,318	286,194	8,394	103,029
19	24,484	310,678	8,814	111,843
20	25,708	336,386	9,255	121,098
21	26,993	363,379	9,717	130,815
22	28,343	391,722	10,203	141,018
23	29,760	421,482	10,714	151,732
24	31,248	452,730	11,249	162,981
25	32,810	485,540	11,812	174,793
26	34,451	519,991	12,402	187,195
27	36,174	556,165	13,023	200,218
28	37,983	594,148	13,674	213,892
29	39,882	634,030	14,358	228,250
30	41,876	675,906	15,075	243,325
31	43,970	719,876	15,829	259,154
32	46,169	766,045	16,621	275,775

CIP 074 Post-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	15,636	15,636	5,629	5,629
2	16,418	32,054	5,910	11,539
3	17,239	49,293	6,206	17,745
4	18,101	67,394	6,516	24,261
5	19,006	86,400	6,842	31,103
6	19,956	106,356	7,184	38,287
7	20,954	127,310	7,543	45,830
8	22,002	149,312	7,921	53,751
9	23,102	172,414	8,317	62,068
10	24,257	196,671	8,733	70,801
11	25,470	222,141	9,169	79,970
12	26,744	248,885	9,628	89,598
13	28,081	276,966	10,109	99,707
14	29,485	306,451	10,615	110,322
15	30,959	337,410	11,145	121,467
16	32,507	369,917	11,703	133,170
17	34,132	404,049	12,288	145,458
18	35,839	439,888	12,902	158,360
19	37,631	477,519	13,547	171,907
20	39,513	517,032	14,225	186,132
21	41,489	558,521	14,936	201,068
22	43,563	602,084	15,683	216,751
23	45,741	647,825	16,467	233,218
24	48,028	695,853	17,290	250,508
25	50,429	746,282	18,154	268,662
26	52,950	799,232	19,062	287,724
27	55,598	854,830	20,015	307,739
28	58,378	913,208	21,016	328,755
29	61,297	974,505	22,067	350,822
30	64,362	1,038,867	23,170	373,992
31	67,580	1,106,447	24,329	398,321
32	70,959	1,177,406	25,545	423,866

CIP 0101 Pre-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	12,278	12,278	4,420	4,420
2	12,892	25,170	4,641	9,061
3	13,537	38,707	4,873	13,934
4	14,214	52,921	5,117	19,051
5	14,925	67,846	5,373	24,424
6	15,671	83,517	5,642	30,066
7	16,455	99,972	5,924	35,990
8	17,278	117,250	6,220	42,210
9	18,142	135,392	6,531	48,741
10	19,049	154,441	6,858	55,599
11	20,001	174,442	7,200	62,799
12	21,001	195,443	7,560	70,359
13	22,051	217,494	7,938	78,297
14	23,154	240,648	8,335	86,632
15	24,312	264,960	8,752	95,384
16	25,528	290,488	9,190	104,574
17	26,804	317,292	9,649	114,223
18	28,144	345,436	10,132	124,355
19	29,551	374,987	10,638	134,993
20	31,029	406,016	11,170	146,163
21	32,580	438,596	11,729	157,892
22	34,209	472,805	12,315	170,207
23	35,919	508.724	12,931	183,138
24	37,715	546,439	13,577	196,715
25	39,601	586,040	14,256	210,971
26	41,581	627,621	14,969	225,940
27	43,660	671,281	15,718	241,658
28	45,843	717,124	16,503	258,161
29	48,135	765,259	17,329	275,490
30	50,542	815,801	18,195	293,685
31	53,069	868,870	19,105	312,790
32	55,722	924,592	20,060	332,850

CIP 0101 Post-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	26,540	26,540	9,554	9,554
2	27,867	54,407	10,032	19,586
3	29,260	83,667	10,534	30,120
4	30,723	114,390	11,060	41,180
5	32,259	146,649	11,613	52,793
6	33,872	180,521	12,194	64,987
7	35,566	216,087	12,804	77,791
8	37,344	253,431	13,444	91,235
9	39,211	292,642	14,116	105,351
10	41,172	333,814	14,822	120,173
11	43,231	377,045	15,563	135,736
12	45,393	422,438	16,341	152,077
13	47,663	470,101	17,159	169,236
14	50,046	520,147	18,017	187,253
15	52,548	572,695	18,917	206,170
16	55,175	627,870	19,863	226,033
17	57,934	685,804	20,856	246,889
18	60,831	746,635	21,899	268,788
19	63,873	810,508	22,994	291,782
20	67,067	877,575	24,144	315,926
21	70,420	947,995	25,351	341,277
22	73,941	1,021,936	26,619	367,896
23	77,638	1,099,574	27,950	395,846
24	81,520	1,181,094	29,347	425,193
25	85,596	1,266,690	30,815	456,008
26	89,876	1,356,566	32,355	488,363
27	94,370	1,450,936	33,973	522,336
28	99,089	1,550,025	35,672	558,008
29	104,043	1,654,068	37,455	595,463
30	109,245	1,763,313	39,238	634,701
31	114,707	1,878,020	41,295	676,087
32	120,442	1,998,462	43,359	719,446

CIP 0317 Pre-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	13,976	13,976	5,031	5,031
2	14,675	28,651	5,283	10,314
3	15,409	44,060	5,547	15,861
4	16,179	60,239	5,824	21,685
5	16,988	77,227	6,116	27,801
6	17,837	95,064	6,421	34,222
7	18,729	113,793	6,742	40,964
8	19,665	133,458	7,079	48,043
9	20,648	154,106	7,433	55,476
10	21,680	175,786	7,805	63,281
11	22,764	198,550	8,195	71,476
12	23,902	222,452	8,605	80,081
13	25,097	247,549	9,035	89,116
14	26,352	273,901	9,487	98,603
15	27,670	301,571	9,961	108,564
16	29,054	330,625	10,459	119,023
17	30,507	361,132	10,983	130,006
18	32,032	393,164	11,532	141,538
19	33,634	426,798	12,108	153,646
20	35,316	462,114	12,714	166,360
21	37,082	499,196	13,350	179,710
22	38,936	538,132	14,017	193,727
23	40,883	579,015	14,718	208,445
24	42,927	621,942	15,454	223,899
25	45,073	667,015	16,226	240,125
26	47,327	714,342	17,038	257,163
27	49,693	764,035	17,889	275,052
28	52,178	816,213	18,784	293,836
29	54,787	871,000	19,723	313,559
30	57,526	928,526	20,709	334,268
31	60,402	988,928	21,745	356,013
32	63,422	1,052,350	22,832	378,845

CIP 0317 Post-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	22,452	22,452	8,083	8,083
2	23,575	46,027	8,487	16,570
3	24,754	70,781	8,911	25,481
4	25,992	96,773	9,357	34,838
5	27,292	124,065	9,825	44,663
6	28,657	152,722	10,317	54,980
7	30,090	182,812	10,832	65,812
8	31,595	214,407	11,374	77,186
9	33,175	247,582	11,943	89,129
10	34,834	282,416	12,540	101,669
11	36,576	318,992	13,167	114,836
12	38,405	357,397	13,826	128,662
13	40,325	397,722	14,517	143,179
14	42,341	440,063	15,243	158,422
15	44,458	484,521	16,005	174,427
16	46,681	531,202	16,805	191,232
17	49,015	580,217	17,645	208,877
18	51,466	631,683	18,528	227,405
19	54,039	685,722	19,454	246,859
20	56,741	742,463	20,427	267,286
21	59,578	802,041	21,448	288,734
22	62,557	864,598	22,521	311,255
23	65,685	930,283	23,647	334,902
24	68,969	999,252	24,829	359,731
25	72,417	1,071,669	26,070	385,801
26	76,038	1,147,707	27,374	413,175
27	79,840	1,227,547	28,742	441,917
28	83,832	1,311,379	30,180	472,097
29	88,024	1,399,403	31,689	503,786
30	92,425	1,491,828	33,273	537,059
31	97,046	1,588,874	34,937	571,996
32	101,898	1,690,772	36,683	608,679

CIP 0318 Pre-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	14,320	14,320	5,155	5,155
2	15,036	29,356	5,413	10,568
3	15,788	45,144	5,684	16,252
4	16,577	61,721	5,968	22,220
5	17,406	79,127	6,266	28,486
6	18,276	97,403	6,579	35,065
7	19,190	116,593	6,908	41,973
8	20,150	136,743	7,254	49,227
9	21,158	157,901	7,617	56,844
10	22,216	180,117	7,998	64,842
11	23,327	203,444	8,398	73,240
12	24,493	227,937	8,817	82,057
13	25,718	253,655	9,258	91,315
14	27,004	280,659	9,721	101,036
15	28,354	309,013	10,207	111,243
16	29,772	338,785	10,718	121,961
17	31,261	370,046	11,254	133,215
18	32,824	402,870	11,817	145,032
19	34,465	437,335	12,407	157,439
20	36,188	473,523	13,028	170,467
21	37,997	511,520	13,679	184,146
22	39,897	551,417	14,363	198,509
23	41,892	593,309	15,081	213,590
24	43,987	637,296	15,835	229,425
25	46,186	683,482	16,627	246,052
26	48,495	731,977	17,458	263,510
27	50,920	782,897	18,331	281,841
28	53,466	836,363	19,248	301,089
29	56,139	892,502	20,210	321,299
30	58,946	951,448	21,221	342,520
31	61,893	1,013,341	22,281	364,801
32	64,988	1,078,329	23,396	388,197

CIP 0318 Post-AS Income and Taxes

Yr	Income Earned	Total Income	Taxes Pd	Total Taxes Pd
1	27,992	27,992	10,077	10,077
2	29,392	57,384	10,581	20,658
3	30,862	88,246	11,110	31,768
4	32,405	120,651	11,666	43,434
5	34,025	154,676	12,249	55,683
6	35,726	190,402	12,861	68,544
7	37,512	227,914	13,504	82,048
8	39,388	267,302	14,180	96,228
9	41,357	308,659	14,889	111,117
10	43,425	352,084	15,633	126,750
11	45,596	397,680	16,415	143,165
12	47,876	445,556	17,235	160,400
13	50,270	495,826	18,097	178,497
14	52,784	548,610	19,002	197,499
15	55,423	604,033	19,952	217,451
16	58,194	662,227	20,950	238,401
17	61,104	723,331	21,997	260,398
18	64,159	787,490	23,097	283,495
19	67,367	854,857	24,252	307,747
20	70,735	925,592	25,465	333,212
21	74,272	999,864	26,738	359,950
22	77,986	1,077,850	28,075	388,025
23	81,885	1,159,735	29,479	417,504
24	85,979	1,245,714	30,952	448,456
25	90,278	1,335,992	32,500	480,956
26	94,792	1,430,784	34,125	515,081
27	99,532	1,530,316	35,832	550,913
28	104,509	1,634,825	37,623	588,536
29	109,734	1,744,559	39,504	628,040
30	115,221	1,859,780	41,480	669,520
31	120,982	1,980,762	43,554	713,074
32	127,031	2,107,793	45,731	758,805

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BIOGRAPHICAL SKETCH

Hank Dunn was born in Great Fall, Montana, on May 5, 1952. Due to his father's military career, Hank received his elementary and high school education at many different schools, both in America and abroad. He graduated from Iowa Park High School in Texas in 1970. Subsequently, he returned to Florida and received his Associate in Arts degree from Indian River Community College in 1971. In 1974 he received his Bachelor of Arts degree from the University of Florida and his Master of Education degree from Florida Atlantic University in 1981. Hank began work on his doctorate degree in 1991.

Hank was married to Darlene Enfinger in 1976 and they have three children, Kelly, Adam and Joshua. He and Darlene lived in Fort Pierce, Florida, for many years before moving to the Gainesville/Ocala, Florida, area to reside.

His professional experience includes eleven years at Indian River Community College where he was the Financial Aid Officer (Director) and six years experience at Lake City Community College as Director of Financial Aid, Registrar and Director of Admissions and Registration. He is currently Dean of Student Services at Pasco-Hernando Community College in New Port Richey, Florida.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

John M. Nickens

John M. Nickens, Chair
Professor of Educational
Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

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Professor of Educational
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

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James Doud
Professor of Educational
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

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This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Education.

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